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THE BUILDER

A RECORD OF ARCHITECTURE AND CONSTRUCTION.

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GOTHIC ARCHITECTURE.

An age which is introspective and critical is seldom one which is marked by great successful creative effort in art, and the century which is past has been a barren one, especially in the domain of architecture, and the sterility of production has been marked in every country of Europe.

We have invented reasons to demonstrate why art in the past lived, and proved to our own satisfaction that the artist was formerly concerned with art alone and almost devoid of the mundane desires and aspirations of the commonplace present. We confuse art with morals, assuming them to be equivalent expressions of one idea; and in other phases of thought we deny that there is any connection between the two. Like the ancient Athenian, our desire has been to hear some new thing; like him we are frequently deceived into accepting old ideas as revelations of the truth, simply because they were expressed in somewhat original form.

Tolstoi, at one end of the scale, represents intellectual and, we may say, fatalistic pessimism: "The science of æsthetics, the science of the beautiful, neither did nor could vanish because it never existed. The Greeks, just like everybody else, considered art good only when it served goodness, and bad when it was in opposition to that goodness. And the Greeks themselves were so little developed morally that goodness and beauty seemed to them to coincide." And again: "To his class belongs the astonishing theory of Baumgartenian Trinity—Goodness, Beauty, and Truth—according to which it appears that the very best that can be done by the art of nations after 1900 years of Christian teaching is to choose as their ideal of life the ideal that was held by a small semi-savage slave-holding people who lived 2000 years ago, who imitated the nude human figure extremely well, and erected buildings pleasant to look at." Tolstoi, like the mystic and socialist he was, finally concludes his summary by saying that "Art is neither a pleasure, a solace, nor an amusement; art is a great matter. Art is an organ of human life transmitting man's reasonable perception into feeling." And the task of Christian art "is to establish brotherly union among men."

According to Mr. Clive Bell,* the essential quality in works of art is that they must possess "significant form," which is that which produces emotion, and in order to appreciate art we only need possess a sense of form and colour and a knowledge of their dimensional space; while he further states, "The forms of art are inexhaustible, but all lead by the same road of æsthetic emotion to the same world of æsthetic ecstasy." As against Mr. Clive Bell we have Mr. March Phillipps, who tells us that art is the expression of life, and in his *rôle* of a latter-day Ruskin again denounces the soullessness and folly of the Renaissance. But none of these writers prove their points; they start with theories, and facts are made to conform to them; but we doubt if any artist would find help or guidance from the criticisms made, though many of them are extremely ingenious. Of quite another character is Mr. Geoffrey Scott's recent work on the Renaissance,† as he builds up his theories from facts instead of inverting the process. More than this, he demonstrates, what is obviously true, that the Renaissance architects were not metaphysicians and moralists, but artists who were not deterred by logical scruples from producing harmonies of line and form, because they could not be made to conform absolutely to the practical requirements of structure. Mr. Scott, whose predilections are clearly in favour of the Renaissance, is more concerned in explaining and proving his point of view than in attacking that of others, which gives his book a practical value not possessed by other recent treatises.

As a broad rule, there are fewer reasons than are generally supposed for assuming that there is any great difference between the "truthfulness" of Gothic architecture and that which followed it—"unmeaning" and unstructural pilasters in Renaissance architecture have their counterpart in "unmeaning" areas of arcading spread over the walls of many mediæval churches. In no period of architectural history have builders, whether mediæval or Renaissance, hesitated to raise parapets and screen walls for architectural effect which have little relation to the roofing behind. The great mediæval church is the rendering of the constructive solution of a problem which gives scope for a perfection of architectural expression, but the same requirements of vault, thrust, and buttress can be carried out in other mediums, while the simpler requirements of domestic architecture—the warehouse and the business building—call for less ingenious and complicated methods of construction, whatever style they have been designed in. We are most of us secretly a little disappointed that the elaborate and ingenious construction of earlier times can be so readily dispensed with by the use of methods of building now known to us—a disappointment which finds exemplification in the reluctance of many to use steel, and in the expressed opinion that it can only be logically used in post and lintel construction. We are unable to see why, if we delight in arch, dome, and vault, and find that steel and concrete enable us to construct them with readiness, we should dispense with their aid because we can cover space more "logically" horizontally. To do so is to set a premium on what is difficult and to become unpracticable theorists, giving more value to ingenuity than to art. We believe that in every age mankind has constructed what he was obliged to construct economically to meet utilitarian wants in the simplest and most direct method known to him, and that, given greater opportunities, he has searched, not for the "most logical expression of structure," but the utmost he was capable of creating to delight his perceptions of beauty.

If the possibilities of ferro-concrete construction had been known in mediæval times, before the Gothic era, and if the materials had been forthcoming, it is certain that the course of architectural development would have been a different one; but if they had been discovered when Gothic development was at its height it is more than probable that the builders of Beauvais would have utilised them, not to institute a fresh departure in design, but as a means which would have enabled them to fulfil their aspirations to obtain more height and dimensions with safety. In a similar way the problems which Wren had to deal with in the dome of St. Paul's would have been simplified, and we have little doubt that neither the Gothic builders nor Wren would have troubled themselves about the truthful or logical use of the new material in the sense that modern critics use these terms. Gothic proportions in windows, vaults, and buttresses were obviously profoundly affected by the possibilities and limitation of stone; but, an ideal or manner of design being once formed and taken as a standard, new methods of obtaining the æsthetic results sought, which saved material and ensured safety, would have been adopted without discussion of abstract niceties. The Norman builders frequently built their huge piers of rough rubble, merely casing them with well-constructed stonework, and it was not until the desire for lighter proportions brought with it the necessity for sounder construction that they were generally adopted.

We think that the architectural requirements of one age give scope for greater architectural expression than those of

* "Art." By Clive Bell. † "The Architecture of Humanism."

another, and that mediæval architecture was the gainer, because the Church required great buildings possessing certain qualities; while the requirements of later ages gave less scope for the supreme expression of æsthetic skill, and therefore, given the equal necessity of any other type of building possessing inherent architectonic possibilities, great architecture would be likely to be produced in any age. For at least four centuries Western Europe devoted its energy so fully to the production of one type of building that all others may be held to be comparatively negligible, which more than any other reason accounts for the greatness of the mediæval ages in art.

The books which are of most value to the student of art are those which are devoted to description rather than to theory, which render Sir Thomas Graham Jackson's work on "Gothic Architecture" especially valuable.* The author states that he has never visited Spain, and considers that he can add nothing of value to what Street and others have written, while the war has prevented his visiting Germany and the Netherlands to revise notes taken years ago. Thus the scope of the work is limited to France and England, in which countries Gothic is at its best, and to Italian Gothic, which may be described as its weakest phase. The last section of the work deals with the various phases of Gothic art in Sicily. Most of the drawings with which the book is especially illustrated have been made by Sir Thomas Jackson at different times during half a century, and, together with the writing, show his intimate knowledge and study of the subject. We like his definition of the three principles which he states have governed the development of Gothic architecture as of every good style the world has seen. They are: "Solidity"—that is, the construction must be sound and good; "economy," used in the original sense of the word—"that is to say, a nice regard for arrangement and proportion, the due observance of circumstance of time and place, of means available, of the materials at your disposal, and of the mode of using them to the best advantage."

"The third principle is that the design should be the æsthetic expression of the construction. For architecture differs from mere building simply in this, that it is the art of building expressively and therefore beautifully. The first two principles are within the compass of everyone, but the third can only be applied in an artistic age and by an artistic people."

These are admirable definitions so long as the third principle is not ridden to death, for, as we have previously said, no style can be defined as being entirely logical, and it is doubtful whether any of the builders of the past have consciously set out to make it so. Constructive knowledge and its limitations have governed the beginnings of style in architecture; but, once a manner and tradition has been formed, we believe the master builders would have availed themselves of any new methods available to carry out their æsthetic conceptions. In other words, in the beginning construction governed style; in later periods of development great builders carried out their conceptions more independently of structural limitations.

The sections of the book dealing with vaulting are admirably explained and illustrated, and form a fitting prelude to a luminous account of the French cathedrals, which gives a vivid and terse picture of one of the greatest and most wonderful periods of architectural development the world has seen, culminating in the cathedrals of Reims, Amiens, and Beauvais. The Provincial French styles of Normandy, Burgundy, Toulouse, and Anjou, the distinctive features of which are well described and illustrated, bring the story of the development of French Gothic architecture to a close. As the writer says, "With Beauvais the history of the development of Gothic architecture in France is complete. We have traced its progress from a simple and tentative beginning at S. Denis and Senlis to Noyon and Sens, where Romanesque tradition was almost lost, and to Paris and Chartres, where it is quite neglected. At Reims the whole system of Gothic architecture is understood and carried out in its entirety, but without weakness. At Amiens the whole theory of construction was displayed and pursued to its logical results with full assurance and a little temerity. At Beauvais it was pushed further still, and if Amiens reached the margin of safety, Beauvais rashly overstepped it." A comparatively short chapter deals with the later geometrical Gothic of France, taking the reader to the fifteenth century.

The remainder of the first volume is occupied with a similar review of the earlier periods of English Gothic, in which the writer says we do not find "that triumphant display of constructive science which we see at Amiens. For one thing, our churches, though covering as much or more ground, are never so high as those French churches where this construction is most thoroughly developed, and there was not the same need for economy."

Sir Thomas Jackson dissents, with most architectural authorities, from Professor Moore's* dictum that true Gothic, being the logical development of a system of equilibrium attained by thrust and counter-thrust, is only to be found in France. As he rightly says, "It limits a style to only one of its manifestations, and vaulting, though important, does not cover the whole ground." An admirable description and analysis of Westminster fittingly closes the first volume.

In the second volume the development of the traceried window to the end of the geometrical Decorated Period precedes general chapters on that epoch, and the Flowing Decorated Period and the development of the English spire are followed by chapters dealing with the Perpendicular and Flamboyant Styles of England and France. Of the Perpendicular style the author writes:—"It has been the fashion to decry it as debased Gothic: as Gothic in its decrepitude; the work of mere mechanical designers, unworthy successors of the artists to whom we owe the noble work of the twelfth, thirteenth, and fourteenth centuries. That in some respects it declines from the standard of Amiens and Westminster may be admitted. But to condemn as a decadent art the style which has given us the glorious towers of Gloucester, Canterbury, Boston, Malvern, and Magdalen College at Oxford, those which cluster round the Mendips or stud the vales of Somerset, the splendid churches of the Fen country, the chapels of Windsor, of Henry VII. at Westminster, and of King's College at Cambridge, than which we might say architecture can add no more, is surely to trifle with the subject and mere pedantry." The story of English Gothic is, we think, rightly held to include Kirby House and other of the earlier pseudo-Renaissance work, but the writer takes a somewhat exaggerated view when he says that the "towers and steeples of Wren and his successors are more Gothic than Classic, and are as alien to Vitruvian rule as Westminster Abbey itself."

The Flamboyant architecture of France is well analysed and compared with English Perpendicular developments, "which never lost that air of severity and constraint with which it began at Gloucester." Sir Thomas Jackson writes:—"The sentiment of Flamboyant architecture in France is very different. Here is gaiety and luxury; dignity is forgotten; all must be joyous, fanciful, and clever."

The section on Italian Gothic, which completes the work, forms the most interesting part of an exceedingly able and scholarly book. "The Italian had none of the superstitious faith in the sanctity of ecclesiastical architecture which surrounded the northern cathedral with holy legend, mystic vision, and saintly miracle. The church itself had for him less mystery and inspired less awe. He was behind the scenes, and saw the working of the machinery and the manufacture of the thunder." In this sentence and another which occurs later—"The ideal of the Italian was colour, that of the Frenchman light and shade"—the author expresses what we feel to be the shortcomings of a style which is alternately over-praised by enthusiasts and somewhat unfairly criticised, for the northern peoples imported into their buildings the mysticism and sense of awe which for us will always be the abiding attraction of mediæval architecture; and it is possible, for this reason, that the palaces of Venice rather than the Italian churches will to us be the most appreciated examples of Italian Gothic. The interesting phases of Sicilian Gothic bring us to the author's conclusion, which ends with an eloquent appeal to architects to regard bygone art as their tutor rather than their model, to bind themselves resolutely to the problems of the day, and to new modes of construction, "to satisfy these demands in the most direct and common-sense way regardless of precedent and authority, and they will be working in the true Gothic spirit."

* "Gothic Architecture in France, England, and Italy." By Sir Thomas Graham Jackson, R.A., F.S.A. In 2 vols. (Cambridge University Press. £2 12s. 6d.)

* "Development and Character of Gothic Architecture." By Professor Moore.

NOTES.

St. Paul's Cathedral.

IT is stated that additional funds are urgently needed to provide for the safety of St. Paul's by strengthening the piers and buttresses. Two years ago an appeal was made for £70,000 for the Cathedral Preservation Fund, but only half the amount was provided when the war broke out. According to a daily paper, "Canon Alexander, Treasurer of St. Paul's, in the course of a statement on the structural condition of the building, said that the vast and imperfectly distributed weight of the dome has caused the present problem. The pier on which work has been going forward for a long time—standing at the critical point of pressure towards the south-west—has been reported in the last few weeks to be showing even graver conditions than had been anticipated. The danger is not so much one of recent settlement as of 'senile decay,' accelerated by the gradual pressure of the dome, the rusting of iron, and internal degeneracy of the extremely inadequate repairs executed at some earlier period. It was said recently that 'only the loyalty of the materials to one another' has kept the fabric safe so far. Some of the most delicate work, thus taken in hand just in time, has already been carried out, but it is not known what difficulties may arise elsewhere." It is unfortunately true that great buildings always entail the expenditure of large sums of money in repairs when they have been in existence for a few hundred years, a result which is largely the effect of the truth expressed in the Eastern axiom, "The arch never sleeps," and St. Paul's is apparently no exception to the general rule. The necessary funds will, we hope, be provided without undue delay.

The Organisation of Scientific Research.

THE Board of Education has issued a very important leaflet, which states that there is a strong consensus of opinion that a special need exists for new machinery and further State assistance in order to promote and organise scientific research, chiefly with a view to its application to trade and industry, and it is therefore proposed to establish a permanent organisation for the promotion of industrial and scientific research. The scheme provides for the establishment of a Committee of the Privy Council responsible for the expenditure of any new moneys voted by Parliament for scientific and industrial research, and a small Advisory Council responsible to the Committee of Council, and composed mainly of eminent scientific men and men actually engaged in industries dependent on scientific research. The primary functions of the Advisory Council will be to advise the Committee of Council, first, on proposals for instituting specific researches; second, *proposals for establishing or developing special institutions or departments of existing institutions for the scientific study of problems affecting particular industries and trades;* third, the establishment and award of Research Studentships and Fellowships. Under the clause we have italicised the Royal Institute of British Architects might apply for a grant for the thorough scientific investigation of dry rot, such investigation to be carried out in connection with a specified college of science, and a great boon would be conferred on the building industry. All particulars of procedure can be obtained through the Board of Education, which, we understand, is more than ever convinced of the necessity for the new departure.

The Housing Problem.

AT the Scottish National Conference, promoted by the Labour Party Housing Committee, one of the speakers stated that private enterprise had absolutely failed to meet the necessities of the case—which is both untrue and unfair, considering that until the last few decades the whole of the housing in the country was provided by private enterprise. The late Government has interfered with the natural laws of supply and demand by imposing what amount to stiff penalties on private enterprise, and it is this interference which is responsible for most of the present shortage. Labour leaders are not concerned with questions of national finance, and the labour sections of the community only contribute indirectly to national taxation. In these circumstances they are inclined to advocate national expenditure, failing to see that their employment depends in no small measure on the ability of individuals to employ their capital remuneratively, which is intimately connected with the state of the national finances. We are, in a measure, glad that the present congestion has occurred, as it may serve to bring home to the community the truth that it is in the national interests that the claims of all classes should receive full and adequate consideration. Another speaker observed that what was necessary was that public authorities should set a standard and see that the speculative builder and others observed that standard. This is true enough, and quite within the powers of the authorities, but it is also necessary that the rewards of enterprise shall not be taken away from the speculator, or the last state of working-class housing may be worse than those which obtained formerly.

Huddersfield Housing.

A SPECIAL meeting of the Huddersfield Town Council has been appointed to consider and report on the means to be taken to make good the undertaking given to the Government to provide accommodation for the increased population which would be brought to the neighbourhood if Huddersfield were made the seat of the British Dyes Industry. The Government is being asked to give special grants on the ground that the dye industry is an urgent national undertaking, while the building societies may co-operate by lending money in accordance with a suggestion made by the Mayor. In the meantime thousands of labourers engaged in the construction of the new works have had to be provided with temporary huts by the company, the lodging-houses are full, and rewards are being offered for information as to empty houses. The housing shortage, acute in most parts of the country, has apparently reached its most acute point in Huddersfield.

Piazza del Popolo, with S. Peter's on the horizon (at the side appears Bernini's Church of S. Maria dei Miracoli). (*See page* 44.)

The "Beata Albertona" (1675): S. Francesco a Ripa, Rome.

BERNINI AND THE BAROCCO:

III.—BERNINI AS A MAN.*

BY SELWYN BRINTON, M.A.

IN the two earlier notices on this subject which have appeared in the pages of the *Builder* † I have treated Bernini's achievement both in sculpture and in architecture; it only remains to me now to complete my survey, within the limits allowed me here, by what I have described under this heading with the title of "Bernini as a Man."

I venture to believe that this may be found not the least interesting part of that survey.

Modern research has done a great deal to revise the position of the gifted artist in relation to what we may call his "*milieu*"—the surroundings, the influence of the spirit of the age in which he lived, and upon which his creative genius expended its treasures.

Gian Lorenzo Bernini was born, as we have noted, in December of 1598; his long and brilliant career ended on November 28, 1680. We are therefore with him far away already from the great creative effort of the Renaissance. "The dawn of his life," says Fraschetti, "was already the sunset of art. He could only inherit from the last survivors of that past the exaggeration of form, the contrast of light and shade, the academic conventionalities of conception and canons of art. . . . His genius has all the enchantment of life among things that are dead—the sweetness of a beautiful living form among the ashes of a deserted dwelling-place."

But not all was dead even within that age. It was an age which saw the Church, recovering herself after the Counter-Reformation, reappear as a vital force in Europe, under the intimate and overpowering influence of the Company of Jesus: it saw Rome, among the general decay of Italian life and politics, assert herself once more as the City of Art and the Centre of Catholicism.

Gian Lorenzo Bernini, established for his early life at Rome under the direct patronage of the Papacy, and of more than one among the College of Cardinals, was exposed to the full current of this movement in Catholic life and thought.

He could not have opposed it; and if he had done so he would have condemned his art to atrophy and extinction. He was exposed to a force which was stronger than himself; and this is perhaps what Adolfo Venturi means when he calls him a puppet of destiny.

But he never had sought to oppose this influence. He absorbed its good and its evil into his art and his personal life; and it is the outworking of this influence in his creative art which I propose to trace in this necessarily brief summary.

That the antique had come to him in youth as a tremendous and overpowering revelation we have traced both in the records of Baldinucci and in the evidence of his own earlier sculpture; that the study of Nature had been no less attractive we saw in the realism of such early creations as the bust of Monsignore Montoya, or the S. Lorenzo, or his later Cardinal Scipione Borghese.

With his S. Lorenzo we have even the story, from his son Domenico, that the artist had thrust his own leg into the flame to note the effect of the shrinking of flesh from fire; and here we have just the material which in the earlier Renaissance would have produced such a realist as Pollaguolo, such an idealist in form as Buonarroti.

But in the moment of his development, when in the exquisite Daphne he had proclaimed to the world the message of a new vision of beauty, he is caught up in the advancement of his Papal patron, and bound fast to the chariot wheels of a triumphant and expansive Papacy. His art is diverted to architecture, wasted—we may almost say—in painting, trammelled with the etiquette, the intimate duties of a Papal Court; and when again he turned to sculpture in later life it was under those new influences with which the Jesuit movement had slowly enveloped him.

The realist of the wonderful bust of Montoya, of the Scipione Borghese, of the lovely and wilful Costanza Buonarelli, the noble classicism of his Apollo and Daphne, and the exquisite reserve of his monument to Carlo Barberini is changed in this later art into the effort to impose upon the marble the sentiment which underlies human endeavour—the sense of monarchic power inspired by a Louis XIV., the outpouring of religious ecstasy of a Saint Theresa.

It is to be noted here that Bernini's whole busy life in Rome had been in close contact with that Jesuit Order which had there its natural centre.

One of his early commissions (A.D. 1622) had been that of the half-figure of Cardinal Bellarmino, procured for him through the influence of Cardinal Farnese, for the Church of the Gesú at Rome—a monument which is still in its place on the left of the high altar. The whole church is indeed a wonderful externalisation of the ideas which lay behind this Jesuit movement of the seventeenth century. "The Jesuit," says Taine, "weakened the redoubtable doctrine of Grace, smoothed over the rigid prescriptions of the Councils and the Fathers, invented the more indulgent direction of the conscience, an easier moral law, a more accommodating casuistry, a facile system of devotion; and by the cleverest manipulation of distinctions, restrictions, interpretations, probabilities, and all the brushwood of theology, succeeded with his supple hands in restoring to mankind the liberty of pleasure. . . . Within these hands"—says this writer—"so ingenious and so delicate Religion has become fashionable. She seeks to please; she adorns her temple like a salon; she even adorns it too much. One would say that she makes a display of her riches; she tries to amuse the eye, to dazzle it, to provoke the sated interest; to appear smart and almost coquettish. . . . To see this style," he adds, "in all its splendour one must go, near the Piazza Venezia, to the Gesú, the central monument of their Society built by Vignola and Giacomo della Porta late in the sixteenth century. The great Pagan Renaissance is continued there—but is altered. The semicircular vaultings, the cupola, the pilasters, the pediments, all the main features of the architecture are, like the Renaissance itself, revived from the antique; but the rest is decoration, and turns to luxury and finery. With the solidity of its site and the roundness of its forms, with the pompous majesty of its pillars surmounted by capitals of gold, with its frescoed ceilings wherein great figures, draped or half-naked, whirl in space, with its paintings enclosed in rich frames of worked gold, with its angels in sculptured relief who spring forward from the ledge of the consoles, this church resembles a magnificent banqueting-hall—some kingly town hall, which decks itself with all its silver, all its glass, its damask linen, its curtains trimmed with lace, to receive the monarch and do honour to its city. . . . Out of all this imposing and dazzling decoration an idea emerges, peals forth its note of proclamation, 'Ancient Rome had united the universe in a single Empire: I revive her power, and I inherit her succession (*Je la renouvelle et je lui succède*). What she had done for the bodies of men I will do for their spirits. By my missions, my seminaries, my hierarchy I will establish universally, eternally, and magnificently the Church.'"

I have used this luminous criticism of the great French writer because it gives just the impression of this wonderful sixteenth-century church, within whose walls Bernini may have listened to those sermons of the famous Jesuit preacher, Padre Oliva, which he illustrated with drawings which survive. This very fact shows how intimately the Jesuit teaching affected his later life; but it is in his systematisation of the colonnade of S. Peter's that this conception of the grandeur and universality of the Church of Rome, which had slowly penetrated his consciousness, finds a definite architectural expression.

"The wide protecting arms, solemn and pitiful as those of Jesus," wrote Fraschetti of those wonderful Bernini designs, which I have already had occasion to notice, "are extended to the fascinated multitude in a majestic circle that seems to enclose the world. The vast piazza, closed in by countless marble columns, animated by the gush of the fountains that gleam with their silvery foam, dominated by the massive obelisk of Sixtus V., pure and severe in its classic lines, is the great courtyard which worthily prepares us for the visit to the supreme temple. . . . This miracle," he adds, "was created by the genius of that portentous magician, Gian Lorenzo Bernini. . . . The colonnade of S. Peter's, simple in its lines, sober in its decoration, is his architectural masterpiece."

But perhaps it is in his later creation of the Cathedra, the Chair of S. Peter, that we come closest to the spirit of his age, that the "fervour of his soul escapes on the wings of the fantastic and the improbable."

"In these bronzes which undulate into the air, in the columns twisted beneath the great cupola, the 'colossi' who support with their forefinger the chair of S. Peter gleaming with gems; in the gladsome angels of bronze and all this refulgent glory of cherubs and angel forms among the cloud and rain of gold, in all that tremendous furnace and flame of gold there reveals itself, together and along with the pomp of the Catholic and Apostolic Roman

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† See our issues for November 26 and December 31, 1915.

Basilica, the ideal of Jesuitism, trying to subjugate the masses beneath the majestic fascination of the grandeur and glory of the Papacy."

This interesting passage of Fraschetti seems to give a very valuable support to my contention; because we have here the famous biographer of Bernini, in a work which is essentially devoted to his artistic creation, discovering in this crown of his achievement in S. Peter's the influence of the great Society of Jesus, seeking to impress with the splendour of Rome, the mighty tradition of her hierarchy, the docile and admiring crowd.

But this was only one side of the movement which sought to catch all the life of the time within its wide net. The other, and far more attractive to the higher and more spiritual minds, and one which appealed strongly to our artist, was that of mysticism; and here we have a whole group of monumental sculpture—"The Ecstasy of Santa Teresa," the "S. Jerome" and the "Magdalen" of the Capella Chigi at Siena, the "Beata Albertona," the "Angels of the Passion," designed for the bridge of S. Angelo, which illustrate very completely this side of the master's sentiment.

Above all, the "Santa Teresa," which to the lover of Bernini must always remain as one of the typical creations of his genius.

Technically we find again here the mastery over the marble which he admired in the "Daphne," the "Costanza Buonarelli," the bust of "Cardinal Scipione," but inspired now by a different sentiment, and aided by a wider knowledge of architectural decoration.

It has been my privilege from time to time within the pages of the *Builder* to call attention to the claims of architectural sculpture, claims which are only now beginning to be understood, at any rate in British art. Bernini, himself a sculptor and architect in one, understood this side of his art completely. He designed his single figures or groups, such as his Papal monuments, the "Constantine," the "Albertona," the "S. Teresa"—definitely with a view to their *locale* and lighting; in this last-named group especially the light is very skilfully planned to heighten the emotional effect by falling full on the recumbent form, the upturned face of the swooning saint.

She is depicted here in the moment of ecstasy when Divine Love, in the form of a beautiful young angel, is about to pierce her heart with his flaming dart. She sinks back overwhelmed at the lovely vision; even the draperies here in their sharp accentuated folds seem instinct with emotion, her whole attitude, her closing eyes and parted lips, her hands (those exquisite hands of Bernini), and lovely naked feet extended in utter abandonment, and the poise of her whole sinking body seems one of almost physical rapture.

The French critics, from De Stendhal to Zola, have not failed to note this point. "Sainte Thérèse," writes De Stendhal, "is represented in the ecstasy of divine love; her expression is the most living and most natural. An angel who holds a dart in his hand seems about to uncover her breast to pierce her heart. He regards her smiling with a tranquil air. What a divine art! What a pleasure to behold!" And Taine—"We returned by Santa-Maria della Vittoria to see the Sainte Thérèse of Bernini. She is adorable; falling back, fainting with love, her hands, her naked feet drooping, her eyes half closed, she sinks away from happiness and ecstasy. Her face is thin but noble in type. This Bernini has discovered here modern sculpture, which is founded on expression, and to complete his effect has arranged the light so that it should pour on this delicate pale face an illumination which seems that of the inner flame, so that through the marble which seems to breathe transfigured to life we see the light of the soul immersed in happiness and rapture." Emile Zola, in his "Rome," goes even further:—"Une vierge ignorante et pure, et qui brisée de volupté ouvre languissement les yeux . . . encore pâmée. . . . Ah, cest á mourir!"

But there is no need to insist too much upon this point. Bernini had to represent a psychical phenomenon in terms of material form; he had to thus translate spirit to matter in terms which would be comprehended by an age which enjoyed the erotic romance

Colossal Statues of S. Andrew and S. Helen: S. Peter's, Rome.

of Cav. Marini as much as the mystic theology of Molinos; and quite apart from this, as Dr. Weibel justly points out, his treatment of the scene is accurately drawn from the saint's own account of the vision that came to her, as described in her autobiography.

There can be no doubt that this wonderful group expressed in plastic art a movement of the spiritual life which affected very deeply the Rome of Bernini. Theresa, the Saint of Contemplation, had become a symbol of this new movement of the soul's life.

> *"Dum tota fervet intimis medullis*
> *Teresa, crescit et coruscus ignis,*
> *Amore flante Numinis. . . ."*

These are the words of a poet of this period, a period of which Taine, still speaking of Bernini's S. Teresa, remarks:—"The commentary of such a group as this is in the contemporary works on mysticism in the famous 'Guide' of Molinos, republished twenty times in twelve years, and which from one palace to another in this idle city of Rome conducted the souls, by the intricate by-paths of a new spirituality, even to love without a lover, and yet further still. While the lofty faith of Spain consumed itself in its Catholicism, like a taper in its flame, and prolonged the feverish enthusiasm which had fired S. Ignatius and S. Theresa, more sensual Italy, taking out the thorns of devotion, drank in its odours as a full-blown rose, and . . . accommodated religion to the voluptuous sweetness of its morals and its sonnets."

In a fascinating romance which appeared some thirty years ago the hero, an English cavalier, coming to Rome indirectly under the Jesuit influence, becomes himself infected by this new view of the spiritual life, and comes to know personally its creator. "This was Michael de Molinos, a Spanish monk, who, coming to Rome some years before, began to inculcate a method of mystical devotion which he had no doubt gathered from the followers of St. Theresa, who were regarded with great veneration in Spain, where the contemplative devotion which they taught was held in high esteem. . . .

To all who came to him for spiritual comfort and advice he insisted on the importance of mental devotion, of daily communion, and of an inward application of the soul to Jesus Christ and to His death. So attractive were his personal qualities, and so alluring his doctrine to minds which had grown weary of the more formal ceremonies and acts of bodily penance and devotion that thousands thronged his apartments, and 'the method of Molinos' became not only a divine message to many, but even the fashionable religion of Rome."

I have dwelt thus fully on the group of S. Teresa, because it expressed an influence which we may certainly believe was part of Bernini's later life. Like this Cavaliere de S. Giorgio in Shorthouse's romance of "John Inglesant," he, too, may have shared in "the act of devotion, which is called the contemplative state, in which the will is so united to God and overcome by that union that it adores and loves and resigns itself up to Him."

There are other figures in which his new sense of the inner life finds expression, notably in the "Beata Albertona," caught up like Teresa herself in the ecstasy of the Divine Vision, or in those lovely angel forms of the Bridge of Sant' Angelo, two of which were placed by Clement IX. in S. Andrea della Fratte.

But I have preferred to speak in detail of the S. Teresa in this side of his art as the most typical, the most supreme in technique, the most lovely in conception. These influences within his art—the message of the marble beauty of the antique world, reaching him as truly as to any Humanist or Quattrocento artist, the fascination of nature and expression of character, the humour of life exhibited in his Carnovale comedies and caricatures, the glory of Rome symbolised in her triumphant Papacy, lastly the inner message, the act of devotion which enters "into the life of God, into the heavenly places of Jesus"—all these are elements within this complex life of Gian Lorenzo Bernini, and all find their utterance within his art.

In the last years of his life he came more and more under the influence of religion, into the intimacy of the great Jesuit preacher, Padre Oliva. Of his painting of "Christ Crucified" at this time he tells his son:—"In this work I have drowned my sins, and Divine Justice will find them washed by the blood of Christ."

But his art is always broadly human; and the epitaph, still upon his house in Rome and set there after his death, expressed truly the character of a life work "before which Popes, Princes, and peoples alike bowed the knee."

S. B.

SLATE TRADE PROSPECTS.

Mr. J. Issard Davies, upon being re-elected chairman of the Carnarvon Harbour Trust, said it was a common thing to say that the slate trade was played out. It was nothing of the kind. It was true that substitutes had been placed on the market, but they had never stood the test. In the last gale of all the only roofing that stood was Carnarvon slates. He hoped, therefore, that the slate quarries would clear for action.

THE SURVEYORS' INSTITUTION.

AN ordinary general meeting of the Surveyors' Institution was held on the 10th inst. at No. 12, Great George-street, Westminster, S.W., Mr. J. H. Oakley, Vice-President, in the chair.

The minutes of the previous meeting were read and confirmed.

It was announced that seven donations had been received for the library in addition to four donations of two guineas each, and it was agreed that the thanks of the Institution be sent to the donors.

Mr. R. M. Kearns (Fellow) then read a paper entitled "Some Notes on Reinforced Concrete," in the course of which he submitted the following notes on reinforced concrete structures. Starting with H.M. New Stationery Office, a building which has attracted much attention, he quoted, with the permission of the Commissioners of H.M. Office of Works, the following extracts from the specification :—

"*River or Pit Ballast.*—To be free from sand and dust, must not contain any traces of calcareous, argillaceous, or other foreign matter, and to be broken into various sizes, so that all shall pass a ¾-in. mesh and be retained on a ¼-in. mesh. The sand to be screened out of the ballast, all passing the ¼-in. mesh to be reckoned as sand.

Sand.—To be freshwater, river, or pit sand, absolutely clean and sharp, properly graded and varied in size; all passing a ¼-in. mesh, and at least 75 per cent. passing an ⅛-in. mesh.

Cement.—The cement shall be Portland (slow-setting) to comply with the British Standard Specification (1910) for Portland cement. The builder is to provide with each consignment the maker's certificate of quality, but such certificate is not to be taken as conclusive. Such tests as the architect may direct will be made from time to time, and no consignment is to be used until the architect has signified his approval. The builder is to deliver consignments in advance for use, so as to permit of twenty-eight-day tests being made without causing delay in the progress of the work.

Formwork.—The whole of the timber centering, etc., used for the formation of concrete work is to be constructed in a solid, rigid, and substantial manner. The centres to be so formed that they may be removed in portions without shaking or jarring the concrete. To be wrought thicknessed and close-jointed, except where walls and ceilings will be plastered, and also to all external work where boarding, rough from the saw and close-jointed, is to be used. No part of the centering is to be removed until the concrete is thoroughly set, and until the consent of the architect has been obtained. The formwork is to be thoroughly cleared of shavings and rubbish, and must be hosed out before the concrete is deposited.

Concrete.—To be made up as follows :—

Cement	1 cwt.
Sand	2 cubic ft.
Ballast	4 „ „

To be sufficiently watered and mixed thoroughly in an approved mechanical appliance to the satisfaction of the architect. Test cubes, 6 in. by 6 in. by 6 in., of the concrete are to be mixed by the builder from time to time as the architect may direct. These cubes are to have an ultimate crushing strength of 1,800 lb. per square inch at twenty-eight days. The concrete to be deposited in layers not exceeding 3 in., unless otherwise permitted by the architect, and to be properly punned and consolidated. The reinforcement to be completely surrounded and covered. No traffic on or over the concrete to be permitted until it is thoroughly set. It is to be protected from frost, inclement weather damage, or too rapid drying, and kept well wetted. No steel, except binding rods or stirrups, is to be nearer than 1½ in. to the external face of concrete, except in thin floor slabs, where the cover may be reduced to ¾ in. No concrete to be used which has been left standing and begun to set. Floors and roof to be finished smooth with a rule. The roof slabs to be laid to fall.

Granolithic Finish.—The upper ½ in. of floors (except where otherwise specified) to be formed of one of cement to two of approved granite chippings to pass a ¼-in. mesh, and to be free from dust. To be laid while the reinforced concrete is green, and to be trowelled off within an hour of laying. This surface finish to be in addition to the structural part.

Steel.—To be obtained from firms approved by the architect, and to be of such quality as to withstand the following tests :—The ultimate tensile strength lengthways with the fibre is not to be less than 27 tons, and no more than 32 tons to the square inch. Specimen pieces of steel are to be bent cold until the ends close over a bar, the diameter of which is the same as that of the piece to be tested. The steel rods throughout are to be of the exact lengths and diameters shown on drawings. No welding or piecing of rods will be permitted, and they are to be bent where required to templates and while cold. After such smiths' work as may be required on the rods has been completed, the steel of which they are formed must present a smooth surface free from seams, flaws, or cracks. Great care is to be exercised in the fixing and maintenance—during the placing of concrete—of the steel rods in the exact positions shown on the drawings, and in securing the links and stirrups by which the rods are to be connected together in the positions shown for them, so that the position of the reinforcement in the finished structure may exactly correspond with the position as designed.

External Finish.—Render the reinforced concrete work where exposed externally with Portland cement and sand in the proportion of one of cement to three of sand, ½ in. thick, finished with an approved floated face. The finishing coat to be applied before the backing is thoroughly set. The concrete is to be hacked to form a sufficient key for the rendering, and is to be cleaned and thoroughly wetted before the rendering is commenced.

Boiler Chimney.—To be lined to a height of 50 ft. with approved Staffordshire firebricks laid in fireclay, with all joints well flushed up. To have 1½ in. air space between the firebrick and concrete, ventilated as directed. The chimney is to be built clear of the building, as shown on drawings.

Flues.—Smoke flues in chimney-breasts are to be formed of terra-cotta pipes 10 in. in diameter and with butt joints."

Bills of quantities were prepared, from which a schedule of prices was made for the adjustment of variations. The most important items were, briefly, as follow :—

Excavation from general area over site	At different depths.	Per yard cube.
Ditto, in pier holes ..	„	„
Planking and strutting ..	—	Per ft. super.
Ferro-concrete (steel taken separately) :—		
In footings to columns ..		Per yard cube.
In columns to basement and sub-ground floors		„
In ditto to other floors (each floor kept separate).. ..		„
In sub-ground and ground floor and in beams to same		„
In other floors and in roof (each kept separate) ..		„
In external walls at various levels (one item)		„
In internal ditto ditto (one item)		„
In area walls		„
In chimney and foundations to same (one item)		„
In bridge (one item)		„
Steel bars prepared and hoisted (one item)		Per ton.
Formwork :—		
To columns, internal or external (one item)		Per yard super.
To floors, including beams (sides of beams, etc., not measured but covered by price) (one item)		„
To staircase (measured on girth of riser and soffite)..		„
To chimney		„
To internal and external walls (one item)		„
To bridge (one item)		„
To retaining walls (measured both sides and on the flat)		„
To mouldings (excepting to columns)		Per foot super."

Proceeding, the author said :—

"I have omitted the prices advisedly. The schedule from which the foregoing items were taken does not coincide with the "Standard Method of Measurement" now recommended for general adoption, but it answered its purpose satisfactorily, and had the "Standard Method" been framed in 1911, when the erection of the New Stationery Office was begun, I doubt, in view of the large quantities of materials involved, whether the concrete required for this building would have been billed in "feet cube" or the steel in "pounds."

A short time ago I saw the bills of quantities for reinforced concrete in connection with a large industrial building, and found that the quantities had been prepared somewhat on the lines of the "Standard Method" from complete drawings, showing reinforcements and other work. Bills of quantities such as these may be admirable so far as they enable contractors to prepare close estimates when tendering, and also in regard to the data they provide for the accurate—though perhaps unnecessarily elaborate—admeasurement of variations, but I think they are incomplete if they fail to give the contractors the total quantity of concrete in "cubic yards," and that of steel in "tons." It may be argued that the contractors themselves are able to calculate these totals from the details given, but it is not fair that they should be called upon to do so, and it would be better for all parties if the calculations were made by the quantity surveyor. If such totals were furnished, in addition to the detailed quantities which only should be priced, the contractor whose tender is accepted could at once make arrangements for obtaining his materials. Further, it is held by estimators that these total quantities are essential and important factors in arriving at the detailed prices on which the tender is based. The contractors would also ascertain the quantity of cement from that given for the concrete. On the proportions of 1 + 2 + 4 they would probably calculate at the rate of 1 sack of cement to ⅓ cubic yd. of concrete. Thus the number of yards multiplied by 3 would give the required number of sacks of cement; dividing this number by 11 (where each sack weighs about 204 lb.) the cement would be shown in tons.

The grand totals to which I have referred would also show the ratio of steel to concrete—generally about 2 cwt. of steel for 1 cubic yd. of concrete—from which the average cost of the complete reinforced concrete, at per yard cube, could be ascertained and, on occasion, made use of when measuring for certificates in respect of advances. In this connection the surveyor would allow about 60 ft. super. of formwork for every yard cube of the finished concrete.

It may be interesting to note that the proportions of the concrete for the industrial building to which I have alluded were 1 cwt. cement, 2¼ cubic ft. of sand, and 4½ cubic ft. of aggregate, as against 1 + 2 + 4, the slightly richer brand adopted by the Office of Works."

The lecturer then proceeded to give some particulars of the New Science Museum, South Kensington, after which he went on to say :—

"Pronouncements are invited on the following points, about which there is diversity of opinion among experts :—

While some authorities allow the formwork to be covered with a wash of lime before the concrete is deposited, in order to ensure good surfaces when the centering is struck, others regard it as unnecessary, and are satisfied if the boards are kept well wetted. And while the formwork is treated with "concrete oil" in some cases, it is condemned in others. It is certain, however, that the formwork should not be oiled if the concrete is to be plastered.

Differences of opinion also exist as to the best means of making concrete waterproof. Experts agree, however, that the concrete should be moderately rich and that the aggregate and sand should be so well graded as to fill, if possible, all pore spaces. The concrete should be mixed and laid with the greatest care, and should be allowed to set and harden before its permeability is tested. Some authorities state that the mixture should be "fairly wet," and that "on no account should a dry mixture be made if intended to be watertight." On the other hand, one authority states that the mixture should be "fairly dry" and "well rammed in thin layers."

Coming to the concrete roof or flat, with its covering of asphalt, the question arises whether the concrete should be finished smooth with a rule, or receive, while it is green, a floating of cement. Either course provides the necessary even surface for the asphalt, which should be applied in two coats, the first being more bituminous than the second. When this method is followed very little trouble arises from expansion and contraction, although, in the case of a very wide flat, unbroken by skylights, it would perhaps be advisable to form expansion rolls in the asphalt. One well-known firm of asphalters prefers to lay the asphalt (two thicknesses of ⅜ in.) on stout canvas nailed to a cement floated surface with zinc nails. It appears that asphalt will adhere very firmly to concrete walls or flats if the surface of the concrete is first painted with coal-tar. The latter should be "heated in small quantities, brought just to the boiling-point, and then applied immediately."

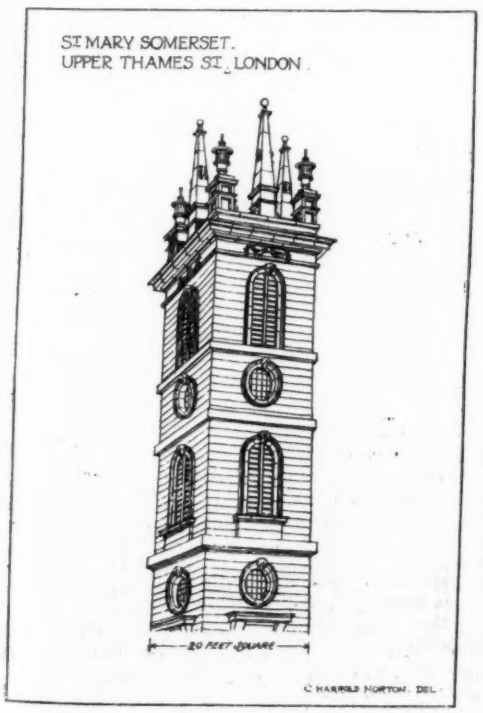
With regard to the various "systems" of reinforcing concrete, can it be declared whether there is cause or just impediment why the rods in beams should not be slightly larger in section and fewer in number? It certainly seems feasible that they should in no case be nearer to each other than 2 in. in order that it may be tolerably easy for the concrete—not thinned out, but containing its proper proportion of aggregate—to "surround" the reinforcements, and thus have a chance of doing its full work."

After making allusions to the new ferro-concrete cathedral at Demerara from particulars given in our issues of November 13, 1914, and December 17, 1915, Mr. Kearns concluded by saying:—

"Let us see to it that our reinforced-concrete buildings are as beautiful as art can devise and funds permit. Mistakes have been made in the past; they have taught us much, but there is still much to learn. We must, therefore, press on to a fuller knowledge of this wonderful building material—of the science that governs its construction and the art with which it should be applied. Difficulties will confront us, but they will not be so formidable that they cannot be overcome.

> **The distant mountains that uprear**
> **Their solid bastions to the skies,**
> **Are crossed by pathways that appear**
> **As we to higher levels rise."**

A vote of thanks to Mr. Kearns for his paper was proposed by Sir Henry Tanner, who made reference to some further interesting facts relating to the construction of both H.M. New Stationery Office and the New Science Museum, South Kensington. The vote of thanks was seconded by Mr. George Corderoy, and supported by Professor Henry Adams, Mr. Hy. Lovegrove, Mr. T. J. Carless, and Mr. J. H. Blizard.



The Chairman announced that the Council had tried to meet the difficulties under the present war conditions not only by altering the time of meeting from eight to five o'clock, but also by reducing the number of meetings, which in future would be held once a month instead of once a fortnight. The next ordinary general meeting of the Institution will be held on Monday, February 7, at 5 p.m., when a paper will be read by Mr. C. F. Slater entitled "Practice in Assessing Dilapidations."

THE LONDON CHURCHES OF WREN AND LATER ARCHITECTS OF THE RENAISSANCE.

No. III.—The Demolished Churches.

ELEVEN London churches escaped the Fire, of which eight still remain, namely, All Hallows, Barking, close to Trinity-square; St Andrew's Undershaft, at the junction of Leadenhall-street and St. Mary Axe; St. Bartholomew the Great, West Smithfield; St. Ethelburga, Bishopsgate; St. Giles, Cripplegate, in Ford-street; St Helen's, Bishopsgate; St. Katherine Cree in Leadenhall-street; and St. Olave's, Hart-street, which still afford some idea of the London churches anterior to the Great Fire. Thirty-five churches were not rebuilt after the Fire, their parishes being united with those of other churches; but of the forty-nine churches rebuilt from Wren's designs within the City of London, fifteen had been demolished before 1907 to make room for other buildings. St. Christopher le Stocks was pulled down to enlarge the Bank of England in 1781; St. Michael, Crooked-lane, was destroyed when the new London Bridge was built; St. Bartholomew by the Exchange, to provide room for the Sun Fire Office; and in 1841 St. Benet Fink was destroyed on the rebuilding of the Royal Exchange.

More churches were pulled down in consequence of the Union of City Benefices Act, and, although the opposition to further destruction is stronger to-day than it was formerly, the danger of further demolition must always be a very great one, because of the immense value of the sites and the need of funds to provide churches in outlying districts where the increase of population has been rapid. But it is to be hoped that the churches which remain will be preserved, since the value of their sites, great as it may be, is small compared with the value of the historic associations of the buildings, forming a link, as they do, with the old London of history. Apart from this, their value as architectural monuments is enormous, as we should realise by imagining Ludgate-hill without St. Martin's, Cheapside without St. Mary-le-Bow, and Fleet-street without St. Bride.

The position of the towers in some of Wren's churches seems ill-chosen, as in many cases they are hidden away in the least prominent position of the sites, the explanation being that as far as possible an endeavour was made to build the new towers in the same position as that occupied by the towers of the churches which formerly occupied their sites.

Among the churches which have been pulled down, few were so interesting as St. Antholin and St. Benet Fink, which we illustrate in this issue from drawings published sixty years ago. The *motif* of St. Mary Abchurch and St. Mildred is the circular dome resting on pendentives; the two churches we illustrate are based on the ellipse, in one case expressed externally by an elongated polygon, in the other partly carried out in a similar way. In both of them the internal conception of design appears to have controlled the external treatment and determined its lines, and they must have been buildings of exceptional interest and charm.

The ellipse is of all forms in architecture one of the most difficult to treat satisfactorily, and for that reason and the constructional problems involved has rarely been indulged in by English architects; while it became, of all curves, the most favoured in many phases of the French Renaissance. The spacing of a colonnade on the curve of an ellipse becomes a complex problem, unless the curve is one of considerable size, as the spacing which is satisfactory and effective in the flattened sides usually appears too wide when employed at the more rapidly curving ends, while any decoration involving concentric elliptical lines is extremely hard to arrange with any degree of satisfaction, since no two true elliptical curves can be completely parallel with one another, which renders the designer's task a hard one. Wren's mathematical tastes frequently led to his complicating a problem in order to have the pleasure of solving it, and these two churches are interesting examples of this tendency, which is more clearly shown in them than in any of his existing churches. The tower and spire of St. Antholin was among the finest of the simpler forms designed by the architect, and, with that of St. Mary Somerset, shows the use of a purely Gothic form, carried out with Renaissance detail. The church of St. Mary Somerset, which stood in Upper Thames-street at the south-east corner of Lambeth-hill, was built in 1695, but only the tower has been preserved.

ARCHITECTURAL SOCIETIES.

The Birmingham Architectural Association: The Palace of Knossos, Crete.

The fifth general meeting was held at the Association's rooms on Friday, 7th inst., the Vice-President (Mr. W. A. Harvey) in the chair, when Mr. Theodore Fyfe, F.R.I.B.A., read a paper on the subject of "The Palace of Knossos, Crete," illustrated by numerous lantern slides.

The lecturer mentioned the fact that he had been present for a considerable time during the unearthing of the palace, so that the audience might know that the observations he was about to make had been acquired first hand and had not been procured from books. It was pointed out that although the discoveries in this particular place could not claim to have revealed much that was of great architectural value in themselves, nevertheless they did throw considerable light upon a somewhat hazy period in the history of architectural development. The period, roughly between 2000 and 1500 B.C., saw the rise and fall of the highest attainments in ancient Crete. There were abundant proofs that Crete, one of the "islands of the seas," was at one time subject to Egypt; but there was little of Egyptian influence to be found, clearly indicating that the peoples of Crete were sufficiently developed in themselves to possess quite a distinctive style of their own in matters of dress and arts and crafts. The discoveries of representations of natural objects in plaster, pottery and fresco showed an unconventionality and vitality which was truly surprising considering the early date at which they were executed. An almost humorous note was struck by some of the slides representing clothed female figures, in that, while viewing them, the imagination was almost tricked into fancying that one beheld modern illustrations of the "latest Paris fashions." An explanation was given and views placed upon the screen to illustrate the methods adopted for the excavation and preservation of the remains of the Palace of Knossos. The plans of this palace, and of others on the island, revealed some curious zig-zag, maze-like methods of planning. The basis of the wall construction was mainly of mud, which was, in many cases, lined, where exposed to the weather, with lime-stone slabs and internally with slabs of gypsum as a dado, with fresco pictures framed in wide borders of design on what might be termed the general eye-line. The mud walls were usually strengthened by built-in wooden posts and beams, while occasionally lime-stone blocks were used for the same purpose. Indications as to the general architecture of the period of the erection of the palace, apart from the remains, could be gathered from fresco representations and from the several delightful little porcelain models of houses which had been discovered.

A vote of thanks to the lecturer was proposed by Mr. Edwin F. Reynolds, seconded by Mr. E. E. Bateman, and supported by Messrs. W. Doubleday, W. Haywood, B. Walker, and the Chairman.

GENERAL NEWS.

Professional Announcement.

Mr. R. Stephen Ayling, F.R.I.B.A., has removed his offices from 8, Dartmouth-street, Westminster, S.W., to Bedford House, 8, York-place, Baker-street, W. His new telephone number is Mayfair 4522.

Appointment.

The Minister of Munitions has appointed Sir Howard Frank, head of the firm of Messrs. Knight, Frank, & Rutley, to be Hon. Adviser on Land Valuation to the Ministry.

The Royal Institute of British Architects.

The Council of the R.I.B.A. have decided to remit the subscriptions and contributions due on January 1, 1916, of all members and Licentiates serving with the Forces who make a written application for such remission before July 1, 1916.

A Shakespeare Tavern.

The "Three Pigeons" at Brentford market-place, an old Elizabethan inn, has been closed as redundant under order of the Middlesex licensing justices. It was the resort of the poets and dramatists of the Elizabethan era.

Admission to Kew Gardens.

Concrete foundations have been prepared at all the gates at Kew Gardens, and some of the turnstiles have been placed in position. When the work is completed the charges for admission will come into force.

St. Margaret's Chapel, Edinburgh.

In connection with the provision of new stained glass windows for St. Margaret's Chapel, Edinburgh Castle, Mr. Douglas Strachan, the artist in stained glass, offered to replace the five windows in the chapel. The one condition he laid down was that the Cockburn Association should present £36, the cost of three of the windows, to some war fund.

Housing Problem at Rhos.

At Wrexham Rural District Council recently it was reported that the first group of houses built by the Council for the working classes at Rhos are ready for occupation. Seventy-five applications were received for twenty-two houses, but after the Council had fixed the weekly rent at 5s., plus rates (7s. 5d. inclusive), most of the prospective tenants withdrew.

A New Calendar.

The Val de Travers Asphalte Paving Company, Ltd., Hamilton House, Bishopsgate, E.C., have sent us an artistic little almanac in bronze metal-work. It is an effective production, and includes a perpetual calendar printed in plain figures.

Building Operations in Nottingham.

Five hundred and eighteen new buildings, including dwelling-houses, of which 155 were certified for occupation, have been erected in Nottingham in 1915. Amongst them have been six public buildings and half a dozen warehouses and factories. Ten other big buildings are now in course of erection.

London Water.

Attention was called at the meeting of the Metropolitan Water Board on the 7th inst. to the fact that the number of "first class" samples from the New River had fallen to 22 per cent. It was explained that the reason was the deterioration of the raw New River water, and the absence of adequate storage. The provision of adequate storage accommodation was engaging the attention of the Chief Engineer.

Safety of St. Paul's.

The appeal for the fund to strengthen the dome supports of St. Paul's Cathedral is being renewed. At least one of the massive piers supporting the dome shows alarming tendencies, it is stated, and work which has already been begun on it has revealed signs of internal crumbling. The danger is described by Canon Alexander as being caused by "senile decay, accelerated by the gradual pressure of the dome, the rusting of iron, and internal degeneracy of the extremely inadequate repairs executed at some earlier period."

Destruction by the German Army in Belgium.

The *Times* correspondent in Paris has communicated the following to that journal:—The Belgian Government has compiled statistics as to the destruction wrought by the German Army in Belgium. The total number of houses and public buildings destroyed is 18,207, and details with regard to Flanders, Limburg, Hainhault, and Luxemburg are lacking. The destruction was most complete at Spontin, where 127 out of 130 houses were burnt to the ground, and at Dinant 1,263 out of 1,375. At Louvain, 1,120 out of 7,433 houses were destroyed, while 1,000 houses were pillaged.

Houses Wanted for Workmen.

At their meeting on the 6th inst. the Highways Committee of the Goole Urban District Council had before them a letter from the Elswick Works, Newcastle-on-Tyne, asking, in connection with the building operations at Barlow, near Selby, if there were any prospects of housing from 100 to 200 skilled workmen in six to eight months' time. The Committee decided to reply, stating that at present there were a large number of vacant houses in the town, and also that they had forwarded the information to the local builders.

Trade after the War.

A Guildhall meeting, called by the Lord Mayor of London to consider the question of "Trade and Employment after the War," is to be held on Monday, January 31, at three o'clock. The Lord Mayor will preside. The meeting has been promoted jointly by the London Chamber of Commerce and the National Patriotic Association, both of which bodies have for many months been considering the industrial and commercial problems which will arise when the war is over. The Lord Mayor is anxious that the meeting shall be thoroughly representative, and he invites the co-operation of the Chambers of Commerce, patriotic bodies, employers' federations, trade organisations, banks, railway companies, etc., in all parts of the country. Inquiries may be addressed to the Hon. Secretaries, Patriotic Meeting, Mansion House, London, E.C.

Fire Losses in 1915.

Fires in the United Kingdom during December were far more costly than in any previous month of the year, largely owing to a number of serious outbreaks during the last few days of the month. Taking into account only fires in which the damage amounted to £1,000 or more, the total cost of the fires during December may be put at £633,000, which compares with losses of £365,000 in November last and £353,000 in December of 1914. On the same basis, the total cost of the principal fires in the United Kingdom during 1915 amounted to £4,207,100 as against losses of £3,745,100 in 1914 and £3,630,400 in 1913. A feature of the experience last year was a number of fires in factories engaged on Government work of various kinds.

Aberdeen Building Trade.

The statistics as to the extent of building in Aberdeen during the past twelve months, for the period from December 1, 1914, to November 30, 1915, show a considerable decrease both in value and the number of plans. The total value of the new buildings, alterations, and additions sanctioned during the year by the Plans Committee of the Aberdeen Town Council was £57,683, as compared with £101,912 in 1914—a decrease of £44,229. The total, which is little more than half of last year's aggregate, includes £15,825 on dwelling-houses, £12,550 on factories and workshops, £6,355 on shops, offices, warehouses, and other business premises, and £21,872 on additions and alterations to buildings. The number of new buildings erected, and additions and alterations carried out was 174, as against 214 in 1914.

National Building Code for Scotland.

An important piece of constructive work in the direction of creating conditions favourable to the resumption and expansion of trade after the war has been achieved by the establishment of a national building code for Scotland. The object of the code, which has just been published by the Stationery Office, is to ensure uniformity of practice in entering into and carrying out building works, from the preparation of the schedules of quantities on which the contractors' tender is based to the payment of the final balance. It is doubtful if anything quite so ambitious in regard to building has been previously attempted on a national scale, and Scotland is believed to be the first country in which it has been done. Up to the present practices have been widely divergent, Edinburgh, Glasgow, Dundee, and Aberdeen each having its own local rules and customs, a state of affairs which has given rise to much confusion on the part of building owners and contractors who conduct business in all of these cities.—*Scotsman.*

The Building Trade in Leeds.

The building trade in Leeds has found itself in the position of many other industries during the past year. While the ordinary branches of building activity have been much restricted from financial considerations, builders on the whole have experienced some compensation from the abnormal erection and extension of engineering works for the purpose of augmenting and accelerating the supply of munitions. The value of building work done in the city is almost up to that of the previous year, though the number of dwellings erected maintains the appreciable shrinkage which has set in since the war began. It is the speculative builder who has suffered the brunt of the burden, for he has had to face not only an increased cost of material and labour, but has had to contend against a largely increased rate of interest on borrowed money, circumstances which have conspired to cripple his business. The estimated value of buildings shown on plans approved by the Corporation for the years ended November 30 was £445,844, as compared with £459,908.

"Mechanical World" Year-Books.

We have received from Messrs. Emmott & Co., Ltd., 65, King-street, Manchester, copies of the *Mechanical World* Pocket Diary and Year-Book and the *Mechanical World* Electrical Pocket-Book for 1916. In the first-mentioned publication the publishers have introduced various new features in this, the twenty-ninth issue of a very useful little book. The section on steam boilers has been largely re-written and much additional information introduced, including particulars of boiler scantlings, the requirements as to boiler mountings, etc. Among the new features of the present issue of the Electrical Pocket-Book is a lengthy section on switch gears and switch boards. The section on lighting circuits and switching has been revised and additional illustrations introduced. Both these handbooks are published at 6d. net each.

Renumbering Specifications on Publication.

We have received from Mr. W. Temple Franks, Comptroller-General, the following notices, which will appear in the *Illustrated Official Journal* (*Patents*) of January 12:—In order to give the public the advantage of having abridgments of specifications up to date while retaining their numerical sequence, applications for patents made subsequent to 1915 will be given new numbers when their complete specifications are accepted or become open to public inspection before acceptance. The new numbers will start with No. 100,001 (without any indication of date), and will supersede the original application numbers in all proceedings after acceptance of the complete specifications. It is intended in future to issue abridgments of specifications in the *Journal* a few weeks later than that in which their acceptance or publication is advertised, so that they will be available for search purposes soon after the printed copies of the specifications are on sale; but, until the system is fully in force, they will only be issued when there are sufficient to make up a full sheet of sixteen pages. The present series of abridgments will run concurrently with the new series in the *Journal* until April, 1917, when it will be entirely superseded.

CORRESPONDENCE.

Architects and Munitions of War.

SIR,—The Royal Institute has been informed by the Ministry of Munitions that there is a serious deficiency in the supply of skilled men for work in munition factories, and that this deficiency is particularly marked in respect of tool-setters. The demand for such skilled workers is altogether greater than the supply at the present time; consequently it is imperative that suitable men should be trained at once for the extremely accurate work of setting up automatic and semi-automatic tools. It is necessary to train men for this purpose to a very high degree of accuracy. In the case of the manufacture of machine-guns the limits are in the neighbourhood of one ten-thousandth part of an inch.

The experience gained from the professional men who are already assisting in this work proves that the most suitable men to be trained are of the more highly educated type. Arrangements have accordingly been made by the Ministry of Munitions for training men of this type. Such men will be given a course of training lasting two or three weeks, during which they will be paid £2 a week, and they will then be drafted straight into factories where they are most urgently required, and where they will be paid the standard rate of wages for the district for tool-setters. This rate varies from £3 10s. a week to £5, according to the district.

The Selection Committee of the Architects' War Committee have been informed of this need and have the matter before them in connection with the War Service Forms of those architects who are over military age or unfit for military service.

ERNEST NEWTON,
President R.I.B.A., Chairman Architects' War Committee.

Factory and Commercial Property Sales, 1915.

SIR,—On the year under review we are pleased to report that the sales and letting of factory property, wharves, land, etc., show far better results than was the case in 1914. This result is in a large measure due to the war, which has produced a great demand for factories and commercial property of all descriptions.

As we anticipated in the early stages of the conflict, a demand would be created for factories, due primarily to the requirements of the Government for the manufacture of the necessary war equipment for our fighting forces, and, secondly, for the manufacture in this country of goods previously imported.

We are glad to say this forecast has been realised, and the nation's immediate wants have necessarily demanded extra pressure of manufacture, which created a necessity for the opening up of factories as well as the extension of present ones to cope with the enormous requirements of the country. We are able to report that we have disposed of a large number of factories with and without plant and machinery, at figures running into many thousands of pounds, and that an unprecedented demand still exists for properties of all kinds.

Premises that previous to the war had failed to find tenants for years have been rapidly taken up, owners in many cases having obtained, through competition, increased prices to those asked.

It is interesting to record, on analysing the demand for factories, that many have been disposed of to the Government, Government contractors in all branches of manufacture, English firms starting to manufacture goods previously imported (now barred through the war), and Belgian manufacturers who largely exported goods to this country, but prevented from doing so now owing to their works having been destroyed by the Germans.

To say the Industrial World of England is busy is a mild term to use; it is in the throes of a boom, and so far as one can judge is likely to be for some years to come.

The declaration of peace should mean the opening up by our manufacturers of an enormous overseas trade with our Colonies, new possessions, and the world's markets in general, and then will come the time for us to "capture the trade" hitherto to a large extent held by the Germans.

We can safely say the outlook for further deals in factory property is good, and think we are justified in hoping to report a continuance of the demand and supply of commercial properties of all descriptions in the present year, not only for the purposes of occupation by manufacturers, but as investment by trustees and others seeking a good, sound, improving security.

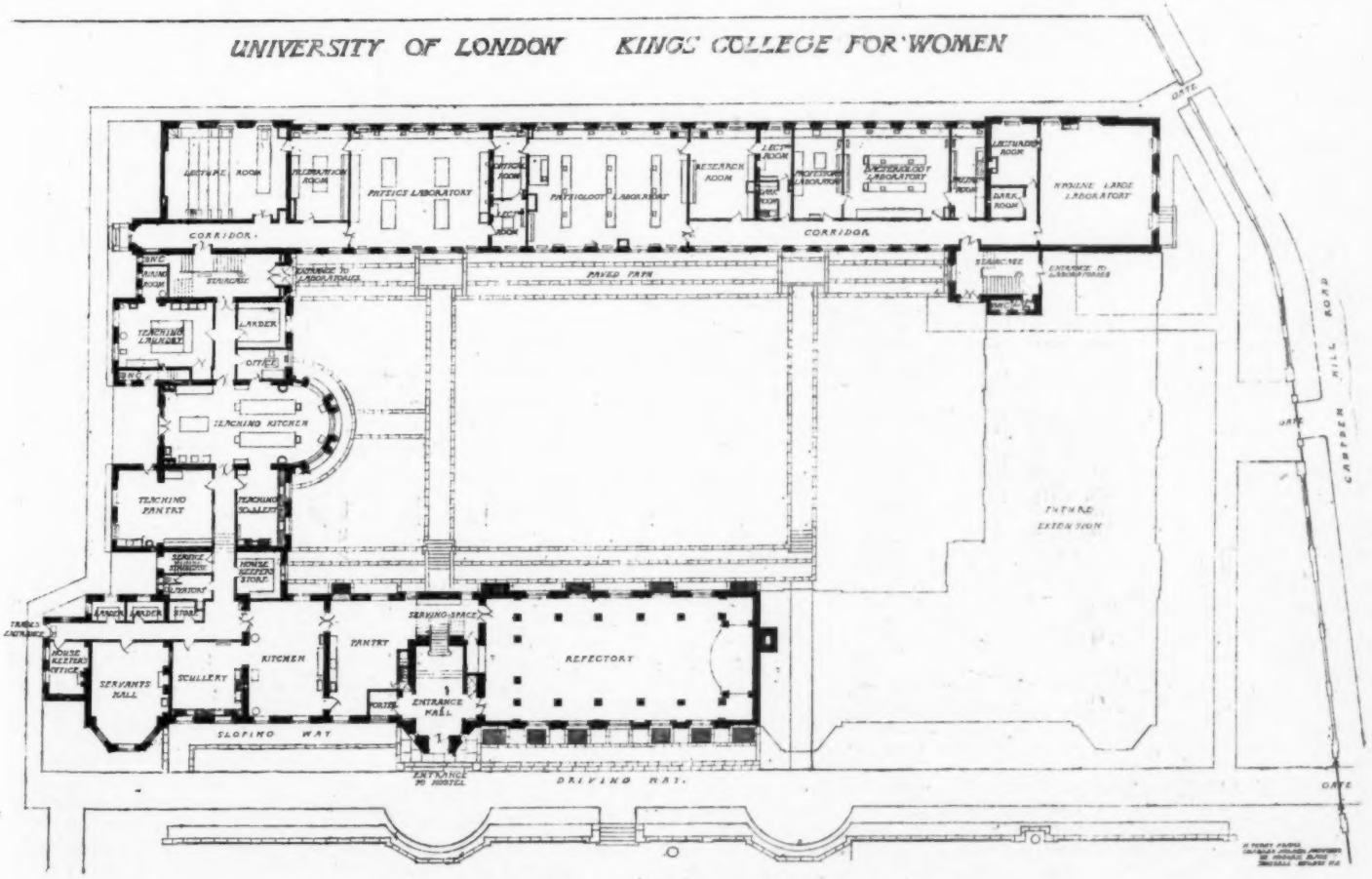
LEOPOLD FARMER & SONS.

MEMORIAL TABLET, FALMOUTH.

The Royal British Colonial Society of Artists have erected a tablet in the Church of King Charles the Martyr, at Falmouth, to the memory of Mr. William Ayerst Ingram, founder and for twenty-six years president of the society. The memorial is the work of Mr. Alfred Drury, R.A.

HOME-GROWN TIMBER AND REQUIREMENTS OF THE GOVERNMENT COMMITTEE.

The Home-grown Timber Committee have received a large number of offers of timber. Any lots which are *prima facie* suitable for the Committee's purposes will be inspected as soon as the pressure upon the staff will permit. Meanwhile (says an official statement) it may be of service to landowners, agents, and others to know that the classes of growing timber at present principally required are:—Acots and Corsican pine, silver fir, Douglas fir, and larch of good dimensions, and in lots of about 20,000 cubic ft. and upwards. Plantation ash of fair size, which will be accepted in comparatively small lots. Other hardwoods of good dimensions are also required; but, as a rule, these cannot be considered in small lots. The Committee are also prepared to enter into arrangements with the owners of estate sawmills for the conversion of timber. The Committee would be glad to be informed of sawmill plant that is idle or not fully employed, in order that, if possible, arrangements may be made for increased output. All communications should be addressed to the Secretary, Home-grown Timber Committee, Craven House, Northumberland-avenue, London.



University of London: King's College for Women.

Messrs. H. Percy Adams and Charles Holden, Architects. (*See page 50.*)

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ILLUSTRATIONS.

Architecture by Bernini.

THESE illustrations are given in connection with an article appearing on page 44.

St. Benet Fink and St. Antholin.

WE reproduce two interesting plates from "The Churches of Sir Christopher Wren," by J. Clayton, which was published by Messrs. Longmans, Green, Brown, & Longman in 1848, and which we give by the courtesy of Messrs. Longmans, Green, & Co. The two churches are dealt with in our article on page 47.

London University: King's College for Women.

THE new buildings stand in grounds of nearly 3 acres on Campden-hill, and situated between Holland Park and Kensington-gardens. The new establishment owes its origin to the introduction of special courses in Household and Social Science in October, 1908, at King's College for Women, then situated in Kensington-square. These courses were instituted with a view to providing education in science and economics of a university standard, and applying the principles thus taught to the management of the home, the hygienic and businesslike conduct of public institutions, and the employment of women in factories and workshops. The introduction of a Domestic Science course into a university, though looked upon by some as a revolutionary step, is no more so than was the inclusion of Agricultural and Engineering courses into the curriculum for men—an innovation that everyone now admits was justified. The movement has received much encouragement, including the practical interest of the Queen and generous contributions amounting to over £100,000.

The buildings already completed comprise Queen Mary's Hostel, the Refectory, and the Anglesey Laboratories. The Hostel was presented by Sir Richard Garton, and received its present name by permission of Her Majesty. The Laboratories were the gift of Lord Anglesey, and the Refectory was provided by Mrs. Wharrie, who has also contributed largely to the endowment of the College.

The buildings are grouped round a quadrangle, which will be completed in the future by the library and official quarters. They are designed on the lines of late Georgian work, with brickwork of a beautiful colour and texture for the facings, and Portland stone dressings concentrated on the principal features of the buildings.

For the complete training of students in Household and Social Science a residence near the Laboratories is essential in order that there may be adequate opportunities for the practical application of the principles and processes studied. There are sixty bed-sitting-rooms, and separate dressing-rooms for each student, rooms for the Warden, common rooms for staff and students, isolation-rooms, and administrative offices in the residential part of the Hostel, and educational facilities are provided by a large kitchen, pantry, and laundry, equipped with modern appliances for practising the domestic arts, and adapted to the needs of large institutions and small homes; a kitchen laboratory is provided in an adjacent building, and easily accessible from the Hostel; and also in the Laboratory block are accommodated the following departments:—Physics, Physiology, Bacteriology, Hygiene, Chemistry, Biology, Psychology, with the necessary rooms for lectures, preparation, and teaching staff.

The new buildings were designed by Messrs. H. Percy Adams, F.R.I.B.A., and Charles Holden, A.R.I.B.A., architects. The general contractors were Messrs. Wallis & Sons, of Maidstone, who also carried out the ferro-concrete construction from details by Messrs. Mouchel & Partners. The Laboratory fittings were made by Messrs. Baird & Tatlock from the architects' designs. Messrs. Doulton did the plumbing and drainage. The entrance gates and head vases were made by Messrs. Elsley, and all the stone carving was carried out by Mr. Broadbent and lettering by Mr. Eric Gill.

MEETINGS.

MONDAY, JANUARY 17.

University Extension Lecture (at the Victoria and Albert Museum).—Mr. Banister Fletcher on "Renaissance Architecture." 4.30 p.m.

WEDNESDAY, JANUARY 19.

Royal Society of Arts.—Mr. Lawrence W. Chubb on "The Common Lands of London—The Story of their Preservation." 4.30 p.m.

Concrete Institute.—Ordinary general meeting. 5.30 p.m.

THURSDAY, JANUARY 20.

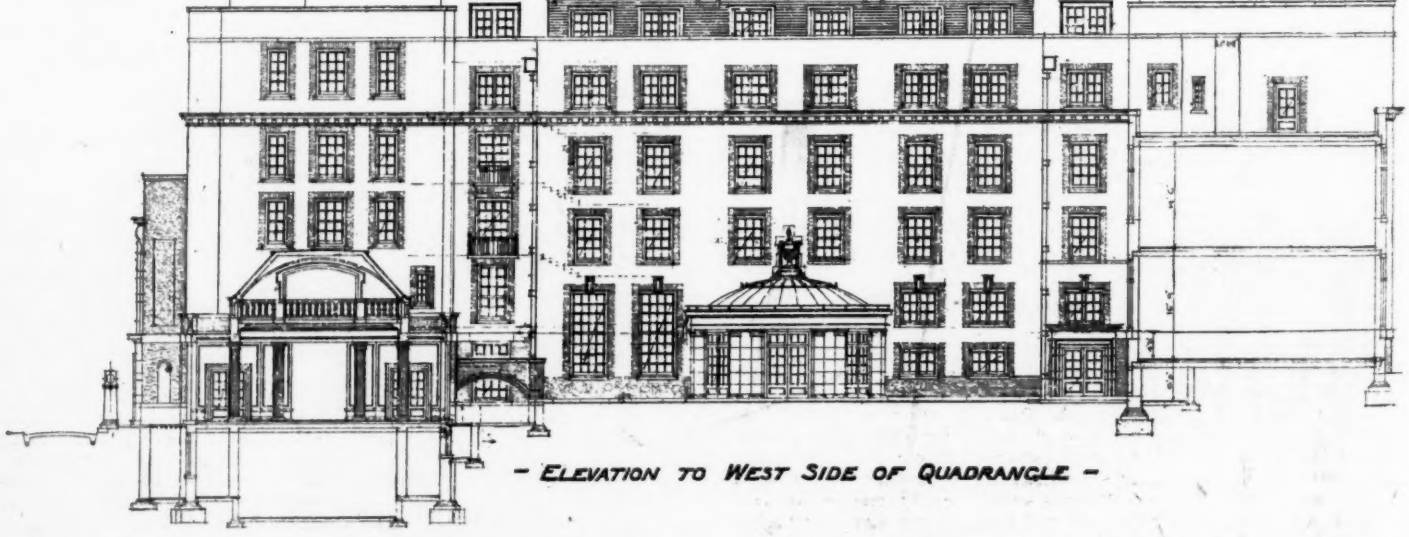
University Extension Lecture (at the British Museum).—Mr. Banister Fletcher on "The Roman Forum." 4.30 p.m.

FIFTY YEARS AGO.

Midland Railway: St. Pancras Station Competition.

OUR readers know that eleven invited architects submitted designs for the proposed new station. The following award has been made:—To Mr. G. G. Scott, R.A., the erection of the building; Mr. G. S. Clarke, premium £200; Mr. E. M. Barry, £100; Mr. T. C. Sorby, £50. The other competitors were:—Messrs. C. P. Cockerell, Darbishire, Lockwood & Mawson, Hine & Evans, Walters & Co., Lloyd, and Owen Jones. The cost of the selected design is estimated at about £280,000.

[*** We give the above extract from the *Builder* of January 13, 1866.—ED.]

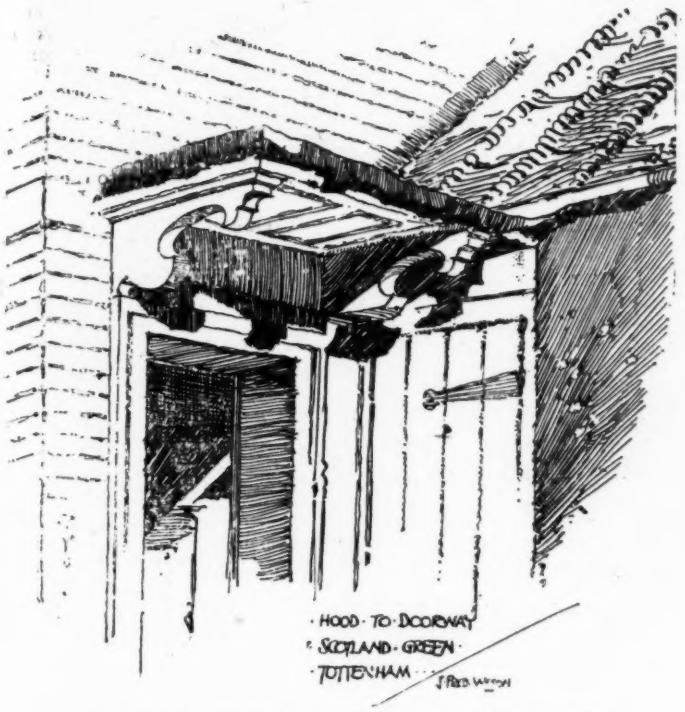


— ELEVATION TO WEST SIDE OF QUADRANGLE —

University of London: King's College for Women.

Messrs. H. Percy Adams and Charles Holden, Architects.

CIVIC DESIGN SECTION.



Hood to Doorway, Scotland Green, Tottenham, N.

Old Post Office and General Store, Muswell Hill, N.

From sketches by Mr. J. Fred Wilson.

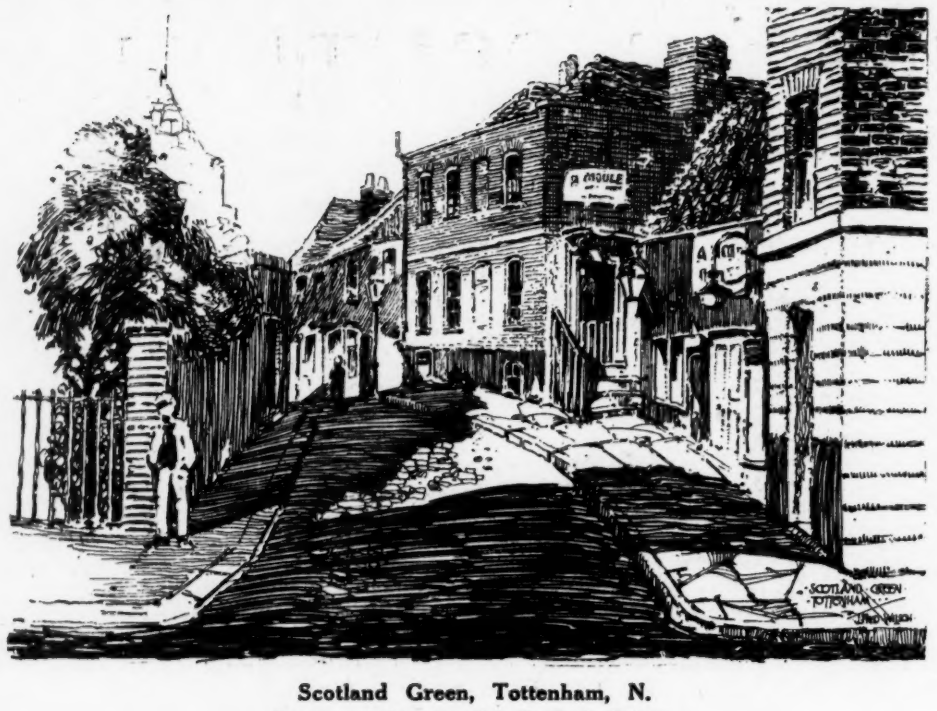
NOTES AND SKETCHES FROM LONDON VILLAGES:

CHRISTMAS DAY.

IN former times, when the country was less timid in its approach to meet the City, London boasted a chain of rural villages within the six-mile radius. To these suburban retreats—north, east, south, and west—the wealthy City merchant nightly repaired, by chaise, by curricle, by hackney coach, or trusty quadruped, there to enjoy the delights of sweet air and pleasant surroundings. A century ago such places were at their zenith of charm; in Queen Victoria's time the railways welded them to the iron heart of London, and during the last twenty years electric trams, omnibuses, and other improvements have almost obliterated their setting. Yet sufficient of their beauty remains to-day to charm and enlighten the student of history. During the Christmas holidays I made pilgrimage to several centres of eighteenth-century life, trudging through the mud and braving the elements in cheerful quest. Once again in spirit I kept company with Samuel Pepys, creeping unobserved into the spacious coach-and-six which drew him up Highgate-hill to Lauderdale House, adjoining Andrew Marvell's cottage. All the way from London Pepys gossiped of the Dutch menace and the varying success of our fleet under the Duke of Albemarle. Arrived at Highgate, the loquacious secretary vanished into the house and left me standing outside, speculating on the early nineteenth-century additions, which appeared to me as a page from Krafft's book. Pensively I turned to search for Marvell's cottage and groped along the brick wall to find an entrance; alas, nothing remained except the stone threshold bedded deep in the wall! Then my thoughts turned to Cromwell House, opposite, with its cheery waistcoat of seventeenth-century red brick, wrought architraves, and generous cornices. From beneath that archway at the side General Ireton's men have marched, and the old house is quite in accord with the present troublous times, for men at arms are ready on every newel post. Highgate is indeed a place of happy memories. Once on a Christmas-time, when the snow was deep, Bacon stopped his coach on the way to St. Albans to stuff a fowl with snow, and to observe the effects of its preservative qualities. Here he caught a fatal chill. Washington Irving walked these classic ways to visit Coleridge at Highgate. Charles Dickens reverenced every brick of the place. I continued my quest to West-hill. Ah, the spirit of the past surely haunts this favoured spot! There is Holly-terrace, built for Mr. Coutts, the banker, and just below is the famous Holly Lodge, with the elegant conservatory designed by John Papworth. Back once more, through Highgate village, past old inns and wrought-iron signs, peeping at coach-yards long deserted of their former traffic, through Hornsey-lane to see Nash's viaduct, and to experience a sense of chagrin when the iron bridge of single span was reached. I remembered a former Christmas visit to this archway thirty years ago, when workmen were busily demolishing the low stone balustrade to prevent the suicidal tendencies of the community, and to erect in its place a wrought-iron grille through which one peered down into the abyss of the cutting and over the spires of London.

Regretfully Highgate was abandoned; no jovial Boniface awaited travellers at the Gate House Tavern to swear them on the Horns; no blacksmith's hammer rang out merrily from Highgate Forge. Whither? I ruminated, then fancy prompted Muswell-hill. Yes, the rendezvous of the fraternity of St. John of Jerusalem, that must be visited of a certainty. Perhaps I shall see the dairy and farm of the Clerkenwell Templars, or view the Nuns' Chapel, with the image of our Lady of Muswell. There is also a possibility of my inspecting the six old-world residences which I remarked on thirty years ago. Thoughtfully I wended my way through acres of small villas, skirted the leafless woods, and then along paved streets to the historic Pursenhall-hill. The once familiar landmarks had entirely vanished; the old-world mansions had gone into the limbo with the rest. Where, I inquired of an old inhabitant, can I find the Elms, the Limes, Summerlands, Hillside, the Firs, and the Oaks? "Ah, sir," he replied, "they now form part of the foundations of the buildings hereabouts, and their grounds are covered with a hundred shops!" Then my attention was directed to a charming little brick box of late eighteenth-century date. "What building is that?" I ventured. "We have a great affection for that building," my guide replied. "Fifty years ago it was the only trading place in the village—a general store and post-office combined; and it is now an ironmonger's, although in the hands of the same family." How typical of their age these unpretentious shops are, replete with bow fronts and fanlights, with glazing bars undisturbed by fashion, and that air of refined simplicity; and what a contrast in style to the adjacent shop, whose consoles alone would fill the diminutive first-floor room! Proportion was the keynote of that age, and reasonable height to width of front. Eight feet for the shop in the clear, 9 ft. for the importance of the first floor, and 8 ft. for the bedroom above. Those who had the framing of building regulations, let us hope, unwittingly changed the whole order of scale in small buildings for the worse, and banished for ever that attribute of human proportion which the eye of an artist relishes.

The morning was yet young, and other villages beckoned me on. Hornsey I knew to be devastated by waterworks and railway tracks, Wood Green to be so in name only. Enfield, Southgate, and Barnet were too far afield for my purpose, but in the distant acreage of bricks and mortar I singled out Tottenham, and pursued my way to it through streets intersected with tramlines and electric light standards, and came at last to Scotland Green (see sketch). Tottenham has ever been a great place for antiquaries, a reputation shared with Clapton. This is Charles Lamb's district as much as Mackery End, in Hertford-



Scotland Green, Tottenham, N.
From a sketch by Mr. J. Fred Wilson.

shire. In one of these houses George Eliot stayed. Along this highway John Gilpin galloped past Edmonton to Ware and back again to London. Along this same Ermine-street the Roman legions marched eighteen centuries ago, and for hundreds of years statesmen, scholars, and peasantry journeyed between Cambridge and London. The very brick houses, strung out in isolated solemnity from Stoke Newington to Royston, bear a family likeness and sport the same brick livery. In the front of Scotland Green—appropriate name to the direction of the great road—there stands a building formerly known as the Blue School, where in old times girls were educated without charge. It is now a school for middle-class pupils, and the charges have correspondingly increased. Near by stood the Watch House, the prisoners' cage, and the house of John Fowler, the parish beadle, who was responsible for the custody of unruly human birds. At times the honest guardian found his hands full, and was forced to send to London for an additional constable. Many old cottages are still *in situ* on Scotland Green. They are distinguished by strange names. For example, Ward's-alley, Tubbey's-alley, Stack-yard, etc. At this point the Moselle crosses the High-road and empties into the Carbuncle Ditch, from thence to swell the waters of the Lea, and so to the Thames. The old Blue Coat School, built in 1735, and endowed with £360 in small benefactions, was rebuilt in 1833. Tottenham offered many other attractions to my imagination; there was so much to be seen, so many things to record, but I resolved to devote future leisure to the study. I had not the courage to explore Walthamstow, which even thirty years ago was a pleasant place, and I knew that the old house which once afforded me shelter as a boy, and the wonderful fruit garden, with its interminable walks, ending in a path to the Forest, no longer existed. Yet the call of the open road was upon me, and by devious ways I tramped through Lea Bridge to the Pond at Snaresbrook, and by the mushroom suburb of Ilford to Romford, which was reached just as the light failed; but my journey was not altogether fruitless, for in the London-road I found buildings of the time of Elizabeth standing in neighbourly humour with youngsters which first saw the sun when Queen Anne ruled her mighty dominions. Had the day been longer I should have found time to explore Chigwell and Brentwood, for enthusiasm waxed within me. But stay, to-morrow will dawn, and then who knows what discoveries will be made? Within two hours I was back at Hampstead, which place has always been thought the chief as well as the most salubrious of London's villages.

BOXING DAY.

Hampstead looked the picture of English charm under the spell of December; it has not suffered in the way of other London retreats. It has been enlarged in all directions, but its old streets are still distinctive as they thread their way through a maze of Victorian houses. It is attached to Hendon on the north and to Cricklewood and Kilburn on the west; it does not recognise the encroachments of Kentish Town or the lordly terraces of Regent's Park. Early in the morning I started my investigations, beginning in John-street, now Keats-grove, with a glimpse at the villa where Keats lived before his last journey to Rome. Hereabouts the early nineteenth-century development of Hampstead is evidenced. There are stuccoed villas, with dainty windows and elegant ironwork, trellis verandahs and covered entrance ways. Heath-street and High-street boast many survivals of the Georgian era, both early and late. Church-row and Flitcroft's steeple stand benign. Frognal still savours of quasi-Gothic taste. Near the Flask is the weather-boarded house and studio, built cheaply in the last years of the eighteenth century for Romney, whom competition crowded out of fashionable London. This I thought to be a fit place to explore, and having gained an entrance, examined the hall, ascended the easy geometrical staircase, and, entered the painter's lofty studio between the wide folding doors. This room suggests nothing more than an assembly-room such as one encounters in a country town. There are the same tall sashed windows, the balcony for musicians, approached by a secret stair in a cupboard, and the same atmosphere of desolation. From a door in this room one catches a glimpse of a large apartment beyond. The Spartan simplicity of the room, its gigantic scale, the delicacy of the beaded architraves and cornice, the entire absence of decoration are in accordance with Romney's last years. How I should have liked to hang the walls with the master's pictures, to swing a candelabra from the centre of the ceiling, to press some willing musicians into the gallery, and then to people the room with the costumes and sparkle of the time! This house is appropriate to the purposes of a Romney museum, yet I doubt if the good folk in the neighbouring houses ever give it a thought or take the trouble to pull the bell and gain admittance. The Spaniards Promenade and Jack Straw's Castle were thronged with happy people, much as has been the case for a century. My Lord Mansfield's House, objective of Gordon rioters, stands within its classic grove of trees, and to the north the square stump of Barnet Church sharply punctuates the landscape, but all these delights must be left for another day.

How I should enjoy a walk to Hendon in the tracks of Bill Sikes and his dog, but Golder's Green is a formidable barrier and has little attraction for me! Shall I go on to Harrow, through Cricklewood, and visit the farm between the Finchley and Edgware roads, or shall I betake my steps to Richmond and Hampton Court? Any of these directions hold potential charms, but, halt! I am due to sup with friends at Mortlake this evening, and long tramps are out of the question. I decide for Mortlake, and, taking train to Kew from Hampstead Station, reach the historic gardens just as evening falls. "Mortlake, sir?" said a happy lamplighter whom I encountered outside Kew Station, balancing himself in the gale at the top of a ladder. "The best way to the 'village' is to walk across the meadows to the High-street; it is about twenty minutes away." I took his advice and made my way beneath dangerous elm-trees, and by spacious old mansions standing alone amidst bleak fields, and came unexpectedly upon the Thames in full flood. Earlier in the day I had entertained thoughts of chartering a boat at Kew and approaching my friend's house by water, climbing his garden wall, and entering by way of the lawn. The angry face of the Thames rebuked me, and I was thankful for the safety of the meadow path. Lights gleamed in the distance, barges rocked sullenly at the wharves, the tall chimney of the brewery at the end of the High-street seemed to rock to the gale. It was a fitting entry to the village of the dead lake, a sombre tapestry rivalling those for which this village was famous when William of Orange kept court at Hampton. In Mortlake I chanced upon the true atmosphere of the London village of the eighteenth century. Old-world houses gave friendly shelter to the passenger, flickering lights deeply recessed behind sashed shop-fronts called attention to seasonable wares. The cupola crowning the tower of Mortlake Church peered down on me in friendly recognition. I was nearing a tangible welcome. My architect friend's house at last! I approached through a paved court and gained the entrance hall with the family portraits—Romney's studio again, but this time full of merry people, some in Georgian costume. A real hanging candelabra, with superfine wax wicks sparkling from every sconce; a perfect forest of greenery, holly and mistletoe included, decking picture frames and other vantage-points. Dances, charades, supper in a dining-room one reads about but seldom sees. A sketch in costume without a plot, arranged by two artist friends, giving the interior of Sir Joshua Reynolds's studio in Leicester Fields, on the occasion of a visit to the painter from Sir William Chambers, while the Duchess of Devonshire was sitting. The latter scene realistic and scholarly even to the small talk and scandal in which her Grace joined concerning the importance of keeping the Royal Academy select and the necessity of keeping interlopers outside its mystic gates. Thus the evening passed in congenial society. My host had some soldiers of the London Scottish billeted upon him, and they were the lions of the revels. It was truly the most interesting and delightful experience of my years. Yet it was not until I put these thoughts on paper that I appreciated how much my walks abroad during the previous days had helped me to enjoy the hospitality, and it is now I realise that architecture and the kindred arts subtly influence our existence.

THE STATE AND HOUSING.

A MEETING of the Scottish National Conference on Housing was opened in Glasgow on the 3rd inst. in the hall of the Scottish Co-operative Wholesale Society in Clarence-street, under the auspices of the Glasgow Labour Party Housing Committee, and was attended by 786 delegates representing 362 trade unions, co-operative societies, guilds, and other bodies. Mr. William Gallacher, director of the Scottish Co-operative Wholesale Society, presided.

The Chairman said the war had raised many new issues, but one of the old issues, the housing question, had been raised in a most acute form. Private enterprise had failed, because they provided houses not so much for the people to

live in as because investment in houses yielded good dividends. The day of private enterprise was over so far as housing was concerned. Housing had become a great national and civic question. The question of interest was the great bugbear to housing reform. The State must advance money and municipalities must administer it. It must be cheap money—money free of interest altogether—if the housing question in this country was to be solved. If money could be found for the war it must be found for housing.

Dr. A. K. Chalmers, Medical Officer of Health for the city of Glasgow, read a paper on "Housing and Health." He said that one-fifth of the dwellings in the city were one-roomed houses and that 13 per cent. of the population occupied them. Diagrams were shown to illustrate the density of population in the various districts of the city. Incidentally, he remarked that the building of houses one on the top of another was the cause of dear land—the best way to cut down the price of land was to cut down the height of the houses. In every single-apartment house in Glasgow there were more than three people—the number of persons per room was greater the smaller the house was, and that had an effect on the death-rate. In one-roomed houses in Glasgow the male vanished after he reached the age of thirty-five and was found in institutions. It was a fallacy that the one-roomed house was necessary for the old men and old women. The old men did not reside there. What had been found by investigation was what they had not expected to find, and that was the enormous excess of child-life in one-roomed houses. That was one of the reasons why they should consider whether the one-apartment house should not be abolished. Statistics were given to show that the children in one-apartment dwellings were less in height and weight and mental capacity than those reared in larger houses, and Dr. Chalmers characterised the shrinkage represented by the figures as a social injustice. Discussing the question of reform, he said they required an authority that could take a wide view over a large area, such, for instance, as the industrial area of the Clyde. The problem of housing on Clydeside was one affecting the workers not of one town only but in the whole area, which was mutually interdependent.

Councillor John Wheatley read a paper on "The Housing Problem: Other People's Remedies and Ours." He said the alarming development of the housing problem had brought them within reasonable reach of a house famine. In every part of the country they had the same story. Private enterprise had withdrawn for the time being from the building of working-class houses. The present scarcity of houses was primarily due to the growth of combines among manufacturers and merchants of building material. There was no local authority in Scotland that was facing as it ought to do this terrible national problem. To tackle it successfully they must build large numbers of healthy houses, and such a building scheme must not be left in the hands of private enterprise. In the plan of the new Scotland for which they were agitating the smallest house would be one of three apartments and a bathroom. The three and four story dwelling had to go. The scheme of the Glasgow Labour Party was to have houses of the cottage type of three apartments and a bathroom. To pay interest of 3½ per cent. on such a scheme they would require a rent of £19 10s. If they could abolish that 3½ per cent. the rent would be £9 14s. They desired to put forward a scheme that would link up every district in Scotland. The capitalist who would lend money without interest did not exist, but the Government could do it. He explained his scheme of securing from the Government money free of interest with which to erect houses of a yearly rental of £9 14s. A certain number of houses would be erected each year, and at the end of sixty-one years the revenue from rent would be sufficient to carry on the scheme without further grants. A Government grant spread over sixty-one years of £2,500,000 per year would enable them to lay out a new Scotland on a new basis. That was only the cost of the war for half a day.

Mr. R. W. Horne, A.R.I.B.A. (City Engineer's Department), read a paper on "Town Planning and Housing."

Buildings in London-Road, Romford, E.

From a sketch by Mr. J. Fred Wilson. (*See page* 51.)

SHORTAGE OF HOUSES.

THE Manchester Tenants' Defence Association proposes to agitate for a remedy for the house famine and to stir up a national agitation, so that the Treasury may be induced to remove the prohibition upon municipal building schemes. The first step will probably be to send a deputation to make representations to the Manchester Sanitary Committee. There is said to be a very considerable shortage of houses in the city. For a few years past speculative building has been on the decline, and the war has almost completely stopped the erection of cottage property. At the same time the Treasury has, for reasons of national economy, put a veto on municipal building, and in the case of Manchester this veto has prevented the carrying out of schemes which the Council had already approved. These municipal projects were not on a scale large enough to provide anything like a remedy for the shortage of houses, but they would have done something, and the leading minds in the Tenants' Defence Association feel the necessity for getting the corporations to begin to tackle the problem, however inadequate their first measures may be. It is represented that, at all events for some years to come, there will be no private enterprise in the building of artisans' houses, and that, as the need for more houses steadily grows, the Corporation must build in the interests of the comfort and health of the community.

The number of new houses built in Manchester in the twelve months ending last October was 410, but 200 of them were in Withington, which is very far from being a working-class district. The average number of the new houses built in the five years 1906 to 1910 was 2,400. Then a decline began. In 1911 the number was 1,578; in 1912 it was 1,072; in 1913, 997; and in 1914, 714. In October last the Sanitary Committee took a census of empty houses rented at 8s. 6d. a week or less, and found 348 in the whole of Manchester, which includes all temporarily vacant pending the arrival of the new tenants. In the districts of Harpurhey, Blackley, Moston, and Cheetham not a single house at 8s. 6d. a week or below was empty.

CIVIC REVIEW NOTES.

Woolwich Housing.

WOOLWICH is in the throes of a house famine. There is, it is said, no single house in the borough or district rented at under £50 to let. People advertise offering premiums to those who find them houses. Small houses can be bought, but the mere purchase does not always give the buyers possession. At the commencement of the war the 13,000 Arsenal workers quickly increased in number, and at least 20,000 to 30,000 workers now want homes close to the Arsenal; while Plumstead, Abbey Wood, Charlton, and Westcombe Park have filled up. A deputation from the Borough Council waited on the Local Government Board in December, 1914, to ask that something should be done, and private enterprise was indisposed to meet what was likely to be a temporary demand. The fluctuations of population have been very marked, depending on the policy of the Government for the time being. In the year preceding the Boer War 15,293 men were employed at the Ordnance works, while during the war a maximum of 27,000 was reached. The establishment was reduced to a minimum of 8,400 in 1908, and Woolwich was almost brought to temporary ruin. Under the large Government scheme 1,200 houses have been built on one estate alone, and large numbers of huts and other premises are also being built; but this has not solved the difficulty, which may have to be met by giving special travelling facilities. One of the problems after the war will be to promote other industries in districts where the population has largely increased because of the special circumstances of war, otherwise the cost of the accommodation provided in the present will prove to be a white elephant.

Warley Town-Planning Scheme.

AT Oldbury District Council a Report was presented upon the new street by-laws which will be applicable in connection with the Warley Town-Planning scheme. The Surveyor stated that the present by-laws for new streets required a uniform width of 42 ft. Under the town-planning scheme the main arterial thoroughfares would have to be considerably wider than this, and the new by-laws would enforce a width of not less than 60 ft. In the case of new streets, where it was obvious there would never be a large amount of vehicular traffic, a width of 40 ft. would be enforced where buildings came up to the building line, but where buildings were set back 30 ft. from the centre of the road a width of 30 ft. would be allowed for the road, ensuring 60 ft. between the opposite rows of buildings. In certain main arterial thoroughfares the width would be 100 ft. We feel there is room for the disappointment of many who think that the appearance of newly-planned districts will be improved by the adoption of wide roads, as when combined with small buildings they accentuate the impression of poverty of design, and suggest monotony. The question of their hygienic advantages is an entirely separate one.

THE BUILDING TRADE.

THE INCREASE OF RENT AND MORTGAGE INTEREST (WAR RESTRICTIONS) ACT.

SINCE the article which appeared in our issue for December 24 was written the Increase of Rent and Mortgage Interest (War Restrictions) Bill has become law, but in a form so different from the original draft that it may be useful to again consider the provisions now embodied in the Act. The original clause 1, which limited the Bill to certain areas, has been eliminated altogether, and now the Act is of general application, except that there are special provisions relating to Scotland and Ireland.

To ascertain to what houses the Act is to apply reference has now to be made to sect. 2, sub-sect. (2), which has been altered in the passage of the Bill through Parliament. The exemption of houses the rateable value of which exceeds £40 has been deleted, and the Act now applies to any house or part of a house let as a separate dwelling where such letting does not include any land other than the site of the house and a garden or other premises within the curtilage of the dwelling-house, where either the annual amount of the standard rent or the rateable value of the house or part of the house does not exceed (*a*) in the Metropolitan Police district, including the City of London, £35; (*b*) in Scotland, £30; (*c*) elsewhere, £26. A new provision has been added that the Act shall not apply to a dwelling-house let at a rent which includes payments in respect of board, attendance, or use of furniture.

A great point was made of retaining the double test of both standard rent and rateable value, but it is hard to see what object is attained, whilst it makes the Act apply to houses of a higher rental than might at first sight be gathered from the Act. It is hardly possible that in any case the house is let at a rent less than the rateable value, so in fact the Act will operate on the rateable value, and will embrace houses let at from a quarter to a third above the limits mentioned in this sub-section.

Not only are houses thus brought into the Act having a rental in London of about £44 and elsewhere £33, but the original intention of the Bill seems to have been totally lost sight of. In the original Bill, in clause 1 it was stated that, "having regard to conditions arising out of the present war," the Act would be applied in certain areas by Order in Council, and in other areas "where it appears to His Majesty that owing to the influx of population or other circumstances attributable to the present war there is a dearth of housing accommodation," and in a note to our article of December 24 we drew attention to the assurance that we understood had been given in Committee that if the scope of the Act was enlarged, yet it would be limited to cases where there was interference with the housing of the working classes, notably in munition areas. In the Act as passed there is not one word of any such qualification, and the Bill is like a quick-change music-hall artist:—Having entered the House as a Bill necessitated by the urgency of the times to prevent certain classes from being exploited, after a brief absence it has returned as a full-fledged Act, limiting any increase in rents and interests on mortgages all over the country, with a very high rental limit and without any reference to the working classes. When the Bill was introduced, imagining that it was a measure intended to redress certain limited though real grievances the consequence of the war, we, as patriotic citizens, withheld any undue criticism of the measure; but in the form the Act has now taken we can only condemn it as a totally uncalled for and ill-conceived piece of legislation which will bear heavily on a class already very hard hit by the war, and which may relieve many persons who are in no need of relief, but to whom the war has brought a considerable increase of wealth and prosperity. It will further discourage building, and thus accentuate the difficulty of finding housing accommodation, and so increase the difficulties and hardships it purports to deal with.

There is now a provision in the Act enabling the landlord to recoup himself for an increase in the rates, including water rates and charges; but in the provision relating to an allowance not exceeding 6 per cent. on the amount expended on the improvement or structural alteration of any dwelling-house it is now expressly stated that this shall not include expenditure on decoration or repairs. Where any increase in rent is made it shall not be recoverable until the expiry of four clear weeks after a notice served by the landlord upon the tenant.

There is also a new section limiting the power of the landlord to obtain an order for the recovery of possession or for ejectment.

As regards mortgages, the Act is rather more favourable to the mortgagee than the Bill was. There is a provision that the Act shall not apply to any mortgage comprising one or more dwelling-houses to which the Act applies and other land if the rateable value of such houses is less than one-tenth of the whole of the land comprised in the mortgage; and where the rate of interest on a mortgage has been increased in pursuance of a notice given before August 4, 1914, demanding either repayment of the capital or an increased rate of interest, such increase is excluded from the operation of the Act. The section which limits the right of a mortgagee to call in his mortgage has also been modified in favour of the mortgagee, and there is an important provision relating to mortgages of leasehold interests where the mortgagee can show that his security is diminishing seriously in value or is otherwise in jeopardy. It also appears that it is intended not to apply the provisions of the Act preventing mortgages from being called in to mortgages where the principal is repayable by periodical instalments extending over a term of not less than ten years or where the mortgagor consents. We have not attempted a complete summary of all the provisions of the Act, but it will be seen that this is a measure which will most seriously depreciate the very class of property which is most heavily taxed for war purposes, and in its present form we cannot but think that no case whatever has been made out, or even been attempted to be made out, for invidious legislation of this character.

THE PROPERTIES OF LIMES AND PLASTERS.—II.

LIMES as a class, including as this does the chief ingredients of hydraulic mortars and cements, are very important materials, and it will be convenient to subdivide the discussion upon them into those of simple structure—(1) the fat and dolomitic limes which will form the subject of this article, (2) the hydraulic limes, and (3) natural and artificial cements.

All limes, whatever their nature, are prepared from some mineral which is substantially carbonate of lime (calcium carbonate $CaCO_3$), either in the form of limestone, chalk, marble, or occasionally shell fragments. These materials often contain other constituents which modify the properties of the resulting lime in a very marked manner; but when the amount is small—say not more than 5 per cent.—the resulting burnt product comes under the category of ordinary non-hydraulic lime, and if the additional constituent is magnesia the product is known as a dolomitic lime.

When calcium carbonate is heated to redness it decomposes into free lime (calcium oxide) and carbonic acid gas (carbon dioxide) thus:—

$$\underset{\text{Cal. carbonate.}}{CaCO_3} = \underset{\text{Cal. oxide.}}{CaO} + \underset{\text{Carbon dioxide.}}{CO_2}$$

And every 100 parts by weight of cal. carbonate thus decomposed produce fifty-six parts of free lime and forty-four parts of carbonic acid gas. The operation is generally conducted in somewhat primitive fashion by heating the limestone or chalk in kilns which are intermittent in working, which represents very great loss in fuel, as after each operation the kiln itself—a tremendous absorber of heat—must be allowed to cool before it can be refilled. Many forms of continuous kilns exist which admit of the addition of the stone at the top, and its withdrawal below when burnt; but the old-fashioned types still exist very largely in this country, doubtless owing to the absence of mechanism and the simpler labour problems thereby involved. Another great source of waste is the total loss of the carbonic acid gas—44 tons, or some 600,000 cubic ft. for every 100 tons of limestone burnt—which could be put to useful purposes. Some attempts have been made to remedy this waste, but until lime is made by some intensive process, small quantities being dealt with at high temperature in a continuous furnace, this waste seems almost inevitable. Free lime has a marked tendency to recombine with carbonic acid gas when in contact with it; the most efficient methods of lime-burning, therefore, must provide for a rapid removal of the gas when liberated. This, of course, ordinarily takes place by simple expansion by heat, which causes a constant upward current in the kiln.

Lime Slaking.

When lime is slaked by the addition of water it becomes hydrated lime, and if eighteen parts by weight of water are added to fifty-six of free lime (that is water equal to one-third the weight of the lime approximately), the whole will remain as a dry bulky powder, the chemical action being:—

$$\underset{\text{(Cal. oxide).}}{CaO} + \underset{\text{Free lime Water.}}{H_2O} = \underset{\text{Hydrated lime.}}{CaO_2H_2}$$

The actual increase in bulk, which is great, depends upon the purity of the lime and the rapidity of slaking. A pure lime—the best fat lime—suddenly slaked into water will expand to a powder three and a half times its original volume; but, if allowed to slowly absorb moisture from the air, will eventually increase to little more than one and a half times its previous bulk. If impure it will expand much less, and the action will be accompanied by but little display of heat. Further addition of water merely converts the hydrate powder into a slurry, or cream, of lime and water; but, as will be seen in a later discussion, lime can, under suitable condition, take up water of crystallisation (see Art. I.) and form a well-defined solid with much more water than is present in the hydrate as described above.

Fat limes, as these pure limes are called, are used chiefly for running "putty"—that is, they are the material of the plasterer—and, though used with sand for mortar, they never attain any appreciable strength, setting merely through mechanical cohesion due to simple drying and to the very low absorption of carbonic acid gas always present in the atmosphere, which gradually reconverts them into limestone, thus:—

$$CaO + CO_2 = CaCO_3.$$

This conversion, however, is never found completed even in the most ancient buildings. It is possible also that the free limes gradually form in some measure the crystallised hydrate referred to above, by absorbing water or water of crystallisation. Fat lime mortars, composed of one of lime to two of sand, possess a tensile strength of 30 lb. to 50 lb. per square inch, and even after a year the latter figure is not likely to be exceeded. This strength is, of course, trivial.

Dolomitic Limes.

Certain limestones contain a notable proportion of magnesia—of such a character is the Mansfield Woodhouse stone, for example. These stones are found in the Permian geological formation which is exposed on the cliffs

at South Shields, and runs in a narrow band to the Midland Counties. These stones consist of calcium carbonate and magnesium carbonate in varying proportions, and when "burnt" give a mixture of free lime and magnesia (MgO) :—

$$\left.\begin{matrix}CaCO_3 \\ MgCO_3\end{matrix}\right. = \left.\begin{matrix}CaO \\ MgO\end{matrix}\right\} + 2\,CO_2.$$

Magnesium carbonate is much more readily decomposed than calcium carbonate, hence these limestones are more readily "burnt." The magnesia, further, does not absorb water with such great activity, nor expand so much during the operation. Thus dolomitic limes in their behaviour on the addition of water somewhat resemble poor limes—that is, those which contain a large proportion of inert materials or which are insufficiently burnt. For this reason, possibly, they do not appear to be very popular; but, although very weak as compared with the hydraulic class of these materials, they are eventually (say, after a year) nearly twice as strong as pure fat limes, and will carry sand better.

Owing to the unskilled labour generally employed for slaking limes, and the consequent danger of lumps of free lime, which would cause eventual disruption in the finished work, limes are often hydrated (dry slaked) by water or steam before they are sent out, which is usually a good investment for the manufacturer. In order to compare prices of quick and hydrated lime, the data already mentioned may be utilised. If bought by bulk it must be remembered that hydrated lime has possibly three times the bulk of free lime in powder, and if by weight the water absorbed represents one-third of the weight of its original quick lime.

DEMARCATION DISPUTES AND THEIR SETTLEMENT.

A CONFERENCE was held at Koh-i-Noor House, Kingsway, London, W.C., recently, to further consider a national scheme for the establishing of committees to deal with demarcation disputes. It was reported that the following unions and associations have definitely approved the rules and intimated readiness to sign the agreement :—National Federation of Building Trades Employers of Great Britain and Ireland; National Federation of Slate Merchants, Slaters and Tilers; National Association of Master Plasterers; National Association of Master Heating and Domestic Engineers; Society of Operative Stonemasons; Manchester Unity of Operative Bricklayers; General Union of Operative Carpenters and Joiners; Amalgamated Society of Carpenters and Joiners; National Association of Operative Plasterers; Amalgamated Slaters' and Tilers' Provident Society; National Association of Builders' Labourers; National Union of Operative Heating and Domestic Engineers; Navvies, Builders' Labourers, and General Labourers' Union; United Builders' Labourers' Union; Amalgamated Society of Woodcutting Machinists; Amalgamated Union of Cabinet Makers; Electrical Trades Union; National Amalgamated Society of Operative House and Ship Painters and Decorators; Operative Bricklayers' Society. It was therefore unanimously resolved :—"That this meeting of representatives of the federations, associations, and societies which have signified their adhesion to the proposed National Demarcation Scheme being satisfied that a sufficient number of adhesions have been secured to warrant the scheme being proceeded with, the said scheme be and is hereby constituted as from this date." The necessary elections of the committees and officers will now be proceeded with, and it is expected the scheme will be in working order in the spring; but in order to deal with any disputes which may arise meanwhile it was unanimously agreed :—"That, in view of the fact that the new organisation cannot be got into working order until the first annual meetings of the respective committees are held in February and March, this meeting requests the Conciliation Boards to place their machinery at the service of those concerned in any demarcation dispute which may arise meanwhile, augmenting their existing membership temporarily by the admission of all parties concerned in any dispute, and that the parties to such disputes be recommended to avail themselves of those services *pro tem.*"

The scope of the scheme is, briefly, the settlement of all questions or disputes relating to demarcation of work that may from time to time arise between the parties, by reference for adjustment to standing joint committees with a view to an amicable settlement of the same without resorting to strikes or lock-outs. In the event of a demarcation dispute or question between trades represented by the societies who are parties to the agreement arising on or in connection with the works of an employer whose federation is a party to the scheme, there shall be no stoppage of work, either of a partial or general character, but such dispute or question shall be considered and dealt with in accordance with the rules and regulations provided. These follow the lines of the National Conciliation Scheme, which has worked successfully for upwards of ten years, but certain special features have been introduced, taken from what seemed most useful in other existing demarcation schemes. The new scheme will work alongside, but independently, of the Conciliation Scheme.

FIRE-RESISTING WALL BOARDS.

As resistance to fire is a very important point with all wall boards, the experiment on "Fiberlic" and other boards will be of interest. An illustration which we have seen shows three boards. No. 1 is "Fiberlic" root fibre board, Nos. 2 and 3 are ground wood-pulp boards. The test was made by means of a blow-pipe with a 2-in. flame, and the boards were heated for three minutes under this intense flame, the tip of the flame actually touching the boards. The photograph shows the resistance to fire of the "Fiberlic" board—it is only just browned; while the other boards, as can be seen from the photograph, were burned through. It is explained that "Fiberlic" is highly fire-resisting because of the special chemical treatment during manufacture of the tough root fibres; added to this is the great density created by hydraulic pressure. This density also gives the material its sound-deadening qualities and makes it a non-conductor of heat and cold. The board, which is manufactured by Messrs. MacAndrews & Forbes, Ltd., Finsbury-court, Finsbury-pavement, E.C., is, we are informed, making considerable headway in this country, although it has only been on the British market a few months.

PROPOSED NEW BUILDINGS AND OTHER WORKS.*

IN these lists care is taken to ensure the accuracy of the information given, but it may occasionally happen that, owing to building owners taking the responsibility of commencing work before plans are finally approved by the local authorities, "proposed" works, at the time of publication, have been actually commenced. Abbreviations:—T.C. for Town Council; U.D.C. for Urban District Council; R.D.C. for Rural District Council; E.C. for Education Committee; L.G.B. for Local Government Board; B.G. for Board of Guardians; L.C.C. for London County Council; B.C. for Borough Council; and P.C. for Parish Council.

Ashby Woulds.—The Council's Surveyor has received plans for a house to be built on the east side of the proposed new road opposite to the Railway Inn, Moira.

Bedford.—The R.D.C. has passed plans for a residence at Putnoe for Mr. A. G. Prosser, and one at Kimbolton-road for Mr. R. Atkins.

Birmingham.—The City Council has sanctioned the extension and equipment of the temporary supply station at Nechells, at an estimated cost of £148,660.

Braintree.—Plans passed by the U.D.C. :—For the erection of two pairs of villas by Mr. E. Warren at Chapel-hill, an office and garage at Manor Works, and a mess-room for Messrs. Lake & Elliot's workmen, and plans for a verandah at the Oak Inn, Chapel Hill.

Bristol.—The Docks Committee has granted permission to the G.W.R. Company to erect two sawdust huts at Portishead Dock. On the question of alternative sites proposed for the erection of the barge loading and intake plant on the east side of the Royal Edward Dock, the Committee has authorised the engineer to proceed with the work on the site between Sheds O. and P., and to accept tenders for the various portions of the work.

Bromley.—The L.G.B. has sanctioned the raising by the West Kent Main Drainage Board of £700 for the construction of a jetty at the outfall works.

Buckie.—The P.C. has approved of the scheme for an extension of the Rathven Parish Hospital.

Cannock.—Messrs. Macfarlane & Robinson are developing some land in connection with their new works at Bushbury for erecting houses, &c., and propose to make some new streets, which they will ask the Council to take over.

Chorley.—The T.C. has approved plans prepared by Messrs. Woodhouse & Howard of the proposed public baths, and are making application to the L.G.B. for a provisional sanction to the borrowing of £10,000, being the estimated amount required for the provision of the baths.

Crayford.—Amongst the improvements to be undertaken in Crayford in the future will be the erection of a large hostel near the works, to accommodate the single men employed by Messrs. Vickers.

Dalton.—The U.D.C. has approved a plan of sanitary additions to the Railway Inn, Askam, for Messrs. J. Thompson & Co., Ltd., of Barrow.

Dundee.—Plans and sections of proposed new buildings, etc., have been passed by the T.C. as follows:—Hilltown, cinematograph theatre for Mr. R. Pennycook; King-street, balcony for trustees of Home for Incurables.

Edinburgh.—At a meeting of the Ladies' Committee of the Scottish Veterans' Garden City Association it was reported that a meeting of representatives of all the committees in Scotland would shortly be held to fix the site of the first building scheme.

Edmonton.—Permission has been granted to the Great Eastern Railway Company by the Metropolitan Water Board to construct a railway siding at Angel-road, Edmonton, and to carry it over Pymme's Brook and across the Accommodation-road, giving access to the Board's intercepting drain by means of a level crossing.

Essex.—The C.C. has decided to carry out certain widenings required on the military road now in course of construction between Stansted and Haverhill, at a cost of £214, the widening on the road from Thaxted to Stamford, at a cost of £65, and a further widening of the same road at a cost of £93 10s. 6d., also to widen the corner at the junctions of the roads leading from Dunmow to Elsenham station and from Braxted to Stansted, at an approximate cost of £50.

Flax Bourton (Somerset).—At a recent meeting of the Somerset C.C. the Mental Deficiency Act Committee reported that they had before them plans of the proposed alterations and additions to the school buildings at the Long Ashton Union Workhouse at Flax Bourton. They resolved that the plans should be submitted to the Board of Control, and it was decided not to put the work in hand until peace had been declared.

Folkestone.—The Kent C.C. have decided to make a new piece of road at Capel, halfway between Folkestone and Dover, to replace that which was damaged by the recent landslip in the Folkestone Warren.

Fowey.—The T.C. has resolved to ask the L.G.B. to hold an inquiry in connection with the proposal to expend £300 on the extension of the cemetery.

London.—The justices have sanctioned the variation of approved plans of alterations to the Crown and Grapes, Little Newport-street, W.C. Plans have been passed for certain alterations to be carried out in the King William the Fourth, 110, Grosvenor-road, and the King's Head, 176, Warwick-street, W. Plans have been approved for alterations or additions at the Lamb, Milton-road, Plaistow (licensee Isaac Harvey), and the Town of Ayr, 6, Victoria Dock-road (licensee, Edward W. Rice).

North Bromsgrove.—The Rubery town-planning scheme promoted by the North Bromsgrove U.D.C. has received the final approval of the L.G.B. The area for which the scheme has been adopted contains approximately 544 acres, and comprises the hamlets of Rubery, the Whetty, and the Eachway.

Ormskirk.—Some members of the D.C. have been appointed to interview the agent to Lord Derby with a view to the purchase of land off Aughton-street for the proposed workmen's dwellings. It is intended to erect on this site, if it is procured, between fifty and sixty cottages when the necessary powers can be obtained from the L.G.B. for the purpose.

Ponders End.—The Metropolitan Water Board has granted permission to the Rees Roturbo Manufacturing Company, Ltd., to construct a siding over the Board's intercepting drain and freehold land immediately south of Ponders End Station.

Retford.—At a recent meeting of the T.C. the architect produced plans for an alternative scheme for an isolation hospital, and the same were considered and ordered to be submitted to the L.G.B. for approval.

Sheffield.—The Corporation has decided to erect 261 houses, at a cost of £75,000, on their Wincobank estate, for the accommodation of munition workers. The City Council propose to close Adsetts-place for the extension of works.

Spain.—The *Gaceta* of December 24 notifies that tenders will be received, within a period of thirty days from that date, at the "Casa Consistorial," Valencia, for the termination of hospital construction works in that city. The

* See also our list of Competitions, Contracts, etc., on page 58.

RATES OF WAGES IN THE BUILDING TRADE.

THE following are the present rates of wages in the Building Trade in the principal towns of England and Wales. It must be understood that, while every endeavour is made to ensure accuracy, we cannot be responsible for errors that *may* occur:—

——	Masons.	Brick-layers.	Car-penters, Joiners.	Plas-terers.	Slaters.	Plum-bers.	Painters.	Masons' La-bourers.	Brick-layers' La-bourers.	Plas-terers' La-bourers.
	d.	d.	d.	d.	d.	d.	d.	d.	d.	d.
Aberdare	9	—	9½	9½	—	9	8	6½	6½	6½
Accrington	10	10	9½	9½	9	9	9½	6½	6½	6½
Altrincham	9½	10	10½	10	8½	10	9	6½	7	7
Ashton-under-Lyne	10½	10½	10	10½	9	10	9	6½	6½	7½
Barnsley	9½	9½	9½	9½	9	9	8½	7½	7½	7½
Barrow-in-Furness.	9½	10	9½	9½	9½	9½	9½	7	7	7
Barry	9½	9½	9½	10	—	9	8½	6½	6½	6½
Bath	8½	8½	8½	8	7½	8	7½	6	6	6
Bedford	8	8	8	8½	8	9	6½	5½	5½	6
Birkenhead	11	11	11	11½	11	11	9½	7	7	7
Birmingham	11½	11½	11½	11½	10½	11½	9½	8½	8½	8½
Bishop Auckland	9	9	9	9	10	9	7½	6	6	6½
Blackburn	10	10½	10	10	9½	10	9½	6½	7½	7½
Blackpool	10½	9½	9½	9½	8½	9½	8½	6	6	6
Bolton	10	10½	10	10½	10	10	9½	6–7	7	7
Bournemouth	8½	9	9	9	8½	9	8½	6½	6½	6½
Bradford	10	10	9½	9½	10	10	8½	7	7	7
Bridgwater	6½	6½	6½	6½	6½	6½	6	4	4	4
Brighton	9	8½	8½	8½	—	8	7	6	6	6
Bristol	10½	10½	10½	10½	—	10½	9½	8	8	8
Burnley	10	10½	9½	9½	8	9½	9½	7	7	7½
Burton-on-Trent	9	9	9	9½	9	9	8½	6½	6½	6½
Bury	10½	10½	10	9	9½	10	9	6	7	7
Cambridge	9½	9	9	9½	9½	9½	7½	6	6	6
Canterbury	8½	8	8	10	—	8½–9	7	5	5	5
Cardiff	10½	10½	10½	10½	10½	10½	9½	7½	7½	7½
Chatham	8	9	9	9	9	9	7½	6	6	6
Chelmsford	8	7½	8½	9	—	7½	6½	5	5	6½
Cheltenham	8½	8½	8½	8½	—	8½	8½	6	6	6
Chester	9½	10	10	9½	9½	9½	8½	6½	7	6½
Chesterfield	9	9	9	8	9	8½	8½	5½	5½	5½
Colchester	8	8½	8½	9	8	9	6	5½	5½	5½
Coventry	10½	10½	10½	10½	9½	10½	9½	7½	7½	7½
Crewe	7½	8	7½	9	8½	8	7½	5½	5½	6
Darlington	9½	10	10	10½	10	9½	8½	7	7	7
Derby	9½	9½	9	9	9	9	8	6½	6½	7
Doncaster	9½	9½	9	9	9	9	8	6½	6½	7
Dudley	8½	8½	9	8½	8½	8	7½	5½	5½	6
Durham	9	9	9½	9	10	9	8½	6	6	6½
East Glam. and Mon. Valleys	10	10	10	10	—	—	9	7	7	7
Exeter	8	8½	8	8½	7½	7½	7	5½	5½	5½
Folkestone	8½	8½	8½	9	8½	8½	7–7½	6½	6½	6½
Gloucester	8	8½	8½	8	8	8½	8	5½	5½	5½
Grantham	8	8	7½	7½–8	7½–8	7	6½	5	5	5
Grays	—	10	10	—	—	9½	8½	7	7	7
Grimsby	9	9	9	9½	9	9	8½	7	7	7
Great Yarmouth	8	8	8	—	8	8	6½	5	5	—
Halifax	10	10	9½	8½	8½	9	8½	7	7	7
Harrogate	9½	9½	9	9	8	9½	8½	6½	6½	6½
Hartlepools	10	10½	10½	10½	10	10	9	7½	7½	8
Hastings	8½	8	8	8½	8	8	7	6½	5½	6½
Hereford	8	8	7½	8½	8	7	7	5½	5½	5½
Huddersfield	10	10	9½	9½	10	9	8½	7½	7½	7½
Hull	10½	10	10	10	10	10	9	8	8	8
Ipswich	8½	8½	8½	9	9	8½	7	5½	5½	5½
Lancaster	10	10	9	9	9	9	9	6	6	6½
Leamington Spa	9	9	9	8½	9	9	8	6	6	6
Leeds	10	10	10½	10	10	10	8½	7½	7½	7½
Leicester	10½	10	10½	10½	10	10	9	7½	7½	7½
Lincoln	9	8½	8½	9	8½	8½	8	6	5½	6½
Liverpool	11	11	11	11	10½	11	9½	7	7	7
Llanelly	9½	9½	9½	8½	9	8½	8	5½	5½	5½
London	11½	11½	11½	11½	—	1s.	9	8	8	8
Loughborough	9	8½	8½	9	9	8½	7½	5½	5½	6½
Luton	9½	9	9	8½	9	8½	7½	6½	6½	6½
Maidstone	9	9	9	9	9	9	8	6	6	6
Manchester	11	11	11	11	10	11	9½	7½	7½	7½
Mansfield	8½	9	8½	8½	—	8½	8	6	6	—
Merthyr Tydfil	9½	9½	9½	9½	8½	9	8	6½	6½	6½
Middlesbrough	10	10½	10½	10½	10	10	8½	7½	7½	8
Newcastle-on-Tyne	11	11	11	11	10	10	9½	7½	7½	7½
Newport, Mon.	10	10	10	10	8½	10	9	7	7	7
Northampton	9	9	9	9	8½	9	8	6	6	6
Norwich	8½	8½	8½	8½	8	8½	7½	6	6	6
Nottingham	10	10	10	10½	9½	10	9	7½	7½	8
Oldham	10½	10½	10½	10	9	10	9½	7	7	7½
Oxford	9½	9	9	9	8	9	8	6½	6½	6½
Plymouth	9	9	9	9	9	9	8	6½	6½	6½
Pontypridd	9½	9	9	9½	9	9	8	6½	6½	6½
Portsmouth	9½	9½	9½	9½	—	8½	7½	7	7	7
Preston	10½	10½	10	9½	9½	10	9½	6	7	7½
Reading	8½	9	9	9½	—	9	7½	6	6	6
Rochdale	10½	10½	10	10	8½	10	9	7	7	7½
Rochester	8	9	9	9	9	8½	7½	6	6	6
Rugby	9½	9½	9½	9½	8	9½	8½	6	6	6
St. Albans	9	9	9	9–10	9	9–10	8	6½	6	6½
St. Helens	9	9½	10	9½	9½	9½	9½	6	6½	6
Scarborough	9	9½	9	8½	8	9	8	7	7	7
Sheffield	10½	9½	10½	9½	10	10	9	7½	7½	7½
Shrewsbury	8½	8½	8½	9½	—	8½	7	5½	5½	5½
Southampton	8½	9½	9½	8½	—	9½	8½	6½	6½	6½
Southend-on-Sea	9	9	9	9	P'cework	9	7	6	6	6
Southport	10	10	9½	9½	9½	9½	9½	6½	7	7
South Shields	11	11	11	11	10	8½	9½	7½	7½	7½
Stockport	10½	10	10	10½	9½	10	9½	6	6½	7½
Stockton-on-Tees	10	10½	10½	10½	10	10	9	7½	7½	8
Stoke-on-Trent	9	9½	9	9	—	8½	8½	6	6	—
Stroud	7½	7½	7½	7½	7½	7½	7	5	5	5
Sunderland	11	11	11	10½	10	9	9½	7½	7½	7½
Swansea	9½	9½	9½	9½	8½	9	9	6½	6½	6½
Taunton	7	7	7	7	—	6	6½	4½	4½	4½
Torquay	8	8	8	8	8	8	8	6	6	6
Wakefield	9½	9½	9	9½	8½	9	8	7	7	7
Walsall	9½	9	9	9	8½	10	8	6½	6½	6½
Warrington	8½	10½	10½	10½	8½	10½	9½	6½	6½	6½
West Bromwich	10	10	10	10½	—	9	8	7	7	7
Wigan	10	10½	9½	9½	9	9½	9½	7	7	7
Windsor	9	9	9	10	—	9	—	6	6	6
Wolverhampton	9½	9½	9½	10	8	10	8	6½	6½	6½
Worcester	8½	9	9	9	9	9	7½	6	6	6
York	9½	9½	9	9½	9½	9	8½	7	7	7

The masons' rate given is for bankers; fixers usually ½d. per hour extra.

estimated cost of the works is 67,657 pesetas (about £2,700).

Stafford.—The B.G. have obtained sanction to the erection of the Cottage Homes, at a cost of £2,500.

Sunderland.—The R.D.C. have made an arrangement with Messrs. Barclay & Co. for the borrowing of £7,000, which the L.G.B. had sanctioned the Council borrowing for the purpose of repairing the sea wall at Whitburn.

Tilbury.—Arrangements are proposed for town-planning the whole district.

Wyken.—The Foleshill R.D.C. has approved plans for 600 houses to be erected in the parish of Wyken by the Coventry Corporation for munition workers.

TRADE NEWS.

Boyle's Latest Patent "Air-Pump" Ventilators have been applied to the new engine house, Dunroyd Mills, Guiseley.

The New Sanatorium, Inverness, is being supplied with Shorland's warm-air ventilating patent Manchester stoves and Manchester grates, by Messrs. E. H. Shorland & Brother, Ltd., of Failsworth, Manchester.

In order to prevent water percolating through the cement work of the Propagation Pits in the Botanical Gardens, at Gasnevin (Dublin), the powder Pudlo has been employed with satisfactory results.

A DECEASED BUILDER'S ESTATE.

The late Mr. Charles Bean King, of Frognal, Hampstead, head of the firm of C. B. King, Ltd., has left estate to the gross value of £32,433.

DESK CALENDAR PAD.

Messrs. Stephens & Carter, Ltd., Green-street, Paddington-green, W., have sent us one of their very useful Desk Calendar Pads for 1916; and they inform us that they will be pleased to forward a similar pad to anybody in the Trade applying for one.

A NEW CALENDAR.

Messrs. Robert Boyle & Co., of 64, Holborn-viaduct, have sent us one of their useful little calendars, in a case for the waistcoat-pocket, for the year, with which are combined architectural scales, which many architects and surveyors will find useful.

CLARIDGE'S ASPHALTE COMPANY.

We are informed of the resignation of Mr. R. T. Wilkinson of his position as a director of Claridge's Patent Asphalte Company, Ltd., thus severing a connection which he has maintained unbroken for sixty-three years. The good wishes of all his friends will go with him in his well-earned retirement. The new director of this company is Mr. W. J. Robinson, who, up to a few years ago, was connected with the timber trade, and may be known to some of our readers.

NEW COMPANIES.

THE undermentioned particulars of new companies recently registered are taken from the Daily Register compiled by Messrs. Jordan & Sons, Ltd., Company Registration Agents, Chancery-lane, W.C.

PIPER & Co. (BUILDERS), LTD. (142,558), 6, New-street, Huddersfield. Registered, December 29. To acquire by purchase or otherwise business of contractors and builders, stone merchants, now carried on by Piper & Co., at Birkly, Huddersfield, and to carry on business of quarry owners, joiners, slaters, and carriers. Nominal capital, £1,000 in 1,000 £1 shares.

EDWARD PUNNETT & SONS, LTD. Registered December 30 (142,563). To acquire, take over, and carry on business of builders and contractors now carried on by George Benjamin Punnett and A. W. Punnett at Tile House Works, Tonbridge, as Edward Punnett & Sons, and to carry on business of electrical, sanitary, gas, water, and general engineers, painters, brick, tile, and cement manufacturers, etc. Nominal capital, £8,000 in 8,000 £1 shares.

CHAPMANS (LONGTON), LTD. (142,594). Registered January 1. To carry on business of manufacturers of, agents for, and dealers in pottery, earthenware, china, stoneware, porcelain, statuary, and works of art, glass workers, bricks, tiles, pipes, colliery owners, engineers, carpenters and woodworkers, builders, shipowners, etc. Nominal capital, £5,000 in 5,000 £1 shares.

THE ARCHITECTURAL ASSOCIATION AND THE ROYAL ARCHITECTURAL MUSEUM:

CHANGE OF PREMISES.

THE following statement, signed by the President of the Architectural Association, has been issued to members of the Association:—

"For some years past the question of premises has been prominently before the Council, owing to the increasing activities of the Association and the growth of the School. The present accommodation is neither adequate nor suitable in normal times, and with a view to a change in the near future the Council acquired the leases of Nos. 35, 37, and 39, Great Smith-street as a preliminary step. This was done with the concurrence of the Advisory Council of the Association, with whom all important matters affecting the welfare of the Association are discussed.

The outbreak of war last year compelled the Council to postpone any further steps towards the acquisition of new premises or the enlargement of the existing building, and the matter has been in abeyance until recently, when an offer was made for the premises in Tufton-street by the National Lending Library for the Blind.

The Council, feeling that this offer was too important to be allowed to pass, consulted the Advisory Council, put the whole matter before them, and informed them fully of the policy pursued in the past and the aims of the Association for the future. The result of the conference was that the Council accepted the offer made by the National Lending Library for the Blind, and has made arrangements for the Association to occupy No. 37, Great Smith-street as temporary premises until the conclusion of the war.

The change of premises will not interfere with the activities of the Association, and the School will be carried on as heretofore.

The question then came before the Council of the best method of dealing with the contents of the Royal Architectural Museum, which occupies nearly one-half of the available space in the building. It has long been a matter of regret that the housing of this very valuable collection of casts has left so much to be desired in the way of suitable space and good lighting, notwithstanding the fact that the Association has spent some hundreds of pounds on its rearrangement and classification.

In recent years the number of visitors has been so small that the cost of the upkeep, which falls on the Association, has not been justified. The Council has therefore come to the conclusion, with the concurrence of the Trustees of the Association, that the wishes of the early promoters of the Museum could best be met by offering the casts to the Royal Victoria and Albert Museum, retaining a few that are necessary for the School. The offer has been accepted, and the casts are now the property of the nation, and the authorities have promised that every facility will be given to students who desire access to them.

These changes have doubtless been made in the best interests of the Association, and after the most careful thought has been given to the matter. The most important result of the change is a very large annual saving in rent and other standing charges, which will go far to meet the heavy losses sustained by the Association owing to the war.

It is hoped that the action of the Council will meet with the approval of all members of the Association. With this end in view, a special general meeting was held on Monday, when fuller details of the matters referred to in this letter were put before the members."

BOOKS RECEIVED.

L.C.C. REGULATIONS RELATING TO REINFORCED CONCRETE, WITH EXPLANATORY NOTES. By Ewart S. Andrews. (London: B. T. Batsford, Ltd. 2s. 6d. net.)

BRIDGE FOUNDATIONS. By W. Burnside. (London: Scott, Greenwood, & Son. 4s. net.)

OBITUARY.

Mr. J. Sutcliffe.

Mr. John Sutcliffe, architect, of Todmorden and Hebden Bridge, died at Harrogate recently, aged seventy years. He was the designer of many of the chapels and schools and the better-class houses in the Calder Valley.

Second-Lieut. A. S. Baxter.

Second-Lieut. Arthur S. Baxter, 18th Middlesex Regiment (Pioneers), died on January 2, at the Empire Hospital, Vincent-square, S.W., of wounds received at Givenchy on December 8. He was the second son of Mr. George Baxter, of Morella-road, Wandsworth-common. He enlisted in the Seaforth Highlanders in September, 1914. He was a Professional Associate of the Surveyors' Institution, and had passed the Fellowship examination; when he joined the forces he was engaged on the land valuer's staff.

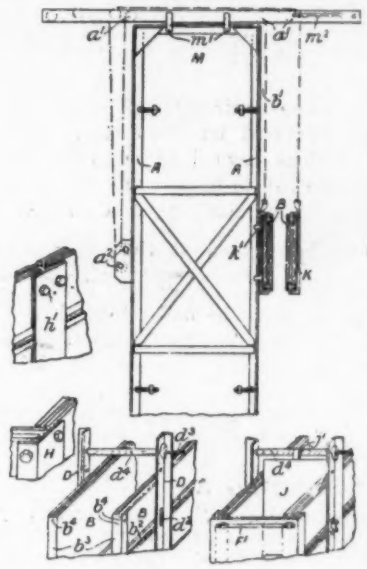
Mr. H. Hems.

The death is announced of Mr. Harry Hems, aged seventy-four years, head of the firm of Messrs. Harry Hems & Sons (Mr. H. Turner Hems and Mr. Wilfrid P. W. Hems), of Exeter. Mr. Hems began life as a cutler in Sheffield; he was then apprenticed to a wood-carver; he visited Italy, and removed from London to Exeter about forty-five years ago. In 1901 he brought out "A Tramp over Mont Cenis Thirty-seven Years Ago." Mr. Hems carried out many designs by Sir Aston Webb, Messrs. Tully & Clark, of St. Louis, U.S.A.; Mr. Hague, of Dublin; Mr. C. E. Deacon, of Liverpool; Mr. E. Sedding; Mr. Doran Webb; Mr. C. Foster Hayward; Mr. Wm. White; Mr. W. H. Nash; Mr. C. E. Ponting; Mr. F. W. Stevens, of Bombay; Mr. G. H. Fellowes Prynne; Mr. J. Oldrid Scott; Sir G. G. Scott; Mr. J. C. Traylen; Mr. J. P. Seddon; and other eminent architects. His chief ecclesiastical works comprise the carving and sculpture, in Cluney and Mansfield Woodhouse stone, for the restoration of the high altar screen, St. Albans Cathedral (October 29, 1887 *); stalls, throne, and carving, St. John's Cathedral, Newfoundland; reredos and high altar, 35 ft. in height, of Caen stone, Christchurch Cathedral, St. Louis, U.S.A. (1912); and the pulpit, Norwich Cathedral (September 5, 1891 *). Deceased also carried out a large amount of ecclesiastical and memorial work all over the country, especially in the West Country.

SELECTED PATENTS.

15,910 of 1914.—Thomas William Bailey: Moulding walls *in situ*.

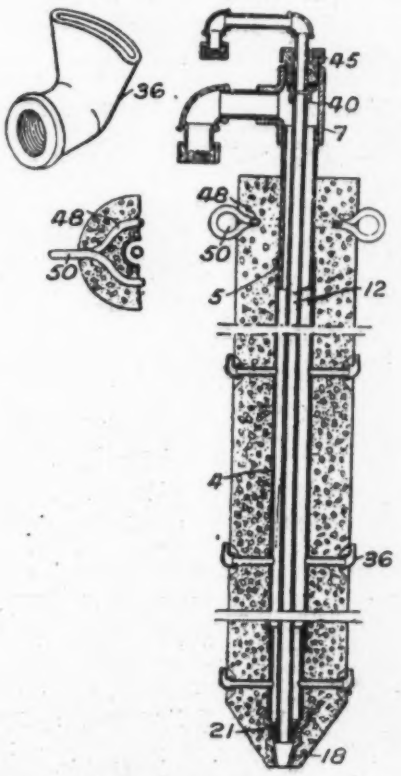
This relates to a method of moulding walls *in situ*, in which the mould boxes or boards B are supported by frames A in such a manner that they can be moved both vertically and longitudinally. The boards are supported by holders K in which they can slide longitudinally, the holders being furnished with clips k^1 embracing T-shaped portions of the frames A. The holders are supported by cables b^1 passing over pulleys a^1 on cantilevers M and over winding-drums a^2. Instead of the holders K, the cables b^1 may be secured to shanks slidably engaging slots in the upper edges of the boards. The ends of the boards are provided with metal plates b^3 furnished with tapped holes b^4 for securing an end plate F^1, an angle connection H, or a plate h^1, for securing two boards end to end. The mould-boards may be spaced apart by angle-irons D, secured by bolts passing through slots d^2 and the slots b^2 and connected by bolts d^3 and sleeves d^4. Partitions J may be suspended from the sleeves d^4 by hooks j^1. One set of pulleys a^1 is adjustable in slots m^2, according to the spacing of the mould-bands. The cantilevers M may be detachably secured by clips m^1, so that the height of the sections A can be increased, and their inner ends may be furnished with a pulley whereby materials may be elevated. Blocks of wood may be positioned within the moulds to form flues or to remain within the wall for the attachment of the skirting or picture rail.



15,910 of 1914.

17,888 of 1914.—Edward Bignell: Sinking caissons, piles, etc.

This relates to piles, caissons, and similar bodies having an excavating nozzle at the lower end and lateral upturned nozzles at the sides with separate water supply to the excavating and upturned nozzles respectively. The pipe 12 for supplying the excavating nozzle 18 is provided at its lower end with a tapered plug 21, which is forced into the tapered interior of the nozzle 18 by a screwed gland 45, which bears on a collar 40 on the pipe 12. The pipe 4 for supplying the lateral nozzles comprises two tubular end sections 5 and a sheet-metal middle section, the lower end section being screwed into the nozzle 18, and the upper end section engaging a supply fitting 7, into which is screwed the gland 45. The side nozzles 36 are of flattened flaring form. A collar 48 provided with projecting eyes 50 is embedded in the concrete of the upper part of the pile, and enables the pile to be attached by a chain to a suitable hoist.



17,888 of 1914.

* Illustrated in the *Builder*.

List of Competitions, Contracts, etc.

For some contracts still open, but not included in this List, see previous issues. **Those with an asterisk (*) are advertised in this number:** Competitions, —; Contracts, vi.; Public Appointments, —; Auction Sales, xviii. Certain conditions beyond those given in the following information are imposed in some cases, such as: the advertisers do not bind themselves to accept the lowest or any tender; that a fair wages clause shall be observed; that no allowance will be made for tenders; and that deposits are returned on receipt of a bona-fide tender unless stated to the contrary.

The date given at the commencement of each paragraph is the latest date when the tender, or the names of those willing to submit tenders, may be sent in.

*** It must be understood that the following paragraphs are printed as news, and not as advertisements; and that while every endeavour is made to ensure accuracy, we cannot be responsible for errors that *may* occur.

Contracts.

BUILDING AND PAINTING.

The date given at the commencement of each paragraph is the latest date when the tender, or the names of those willing to submit tenders, may be sent in.

JANUARY 17.—**Bristol.**—PAINTING, ETC.—Painting, distempering, etc., at homes at Teawell-hill, Staple-hill, for the Guardians. Mr. J. J. Simpson, Clerk to the Guardians, St. Peter's Hospital, Bristol.

JANUARY 17.—**Ossett.**—PAINTING, ETC.—For painting and decorating the Primitive Methodist Church, South-parade, Ossett. Specification of Mr. G. H. Lucas, Post Office, South-parade, Ossett.

JANUARY 19.—**Helston.**—REPAIRS, ETC.—Internal and external repairs, etc., at Helston Police-station, for the Cornwall C.C. Standing Joint Committee. Specifications may be seen at the Police-station, and further particulars will be supplied on application to Mr. L. D. Thompson, County Surveyor, County Hall, Truro.

JANUARY 21.—**Manchester.**—CONTRACTORS' AND PLUMBERS' WORK.—Execution of general contractors' and plumbers' work that may be required in connection with the drainage of houses and other premises for a period of twelve months ending March 31, 1917, for the Corporation. Forms of tender, etc., of Mr. H. Prescott, Manager of the Drainage Department. Deposit, £1 1s.

JANUARY 24.—**Richhill (Ireland).**—COTTAGES.—Erection of three cottages at Richhill station for the Great Northern Railway Company (Ireland). Drawings and specification may be inspected at the Engineer's Offices at Dublin and Belfast, and bills of quantities and forms of tender obtained from Mr. T. Morrison, Secretary, Secretary's Office, Amiens-street Terminus, Dublin. Deposit, £1 1s.

JANUARY 27.—**Galway.**—CONCRETING.—Concreting of passenger platforms at Galway station for the Midland Great Western Railway of Ireland. Plans and specification of Mr. Wm. Purcell O'Neill, Chief Engineer to the Company, Broadstone Terminus, Dublin. Deposit, 10s.

JANUARY 31.—**South Milton.**—REPAIRS, ETC.—For repairs and alterations to farm buildings at Whitlocksworthy, S. Milton, near Kingsbridge. Specifications, etc., of Messrs. Bourne & Sons, land agents, Totnes.

FEBRUARY 9.—**Lancashire.**—PAINTING.—For painting at various places for the Directors of the Lancashire and Yorkshire Railway. Forms of tender, etc., on personal application at the Engineer's Office, Hunt's Bank, Manchester.

FURNITURE, MATERIALS, etc.

JANUARY 14.—**Manchester.**—IRON, STEEL, ETC., WHITE LEAD.—Supply to the directors of the Manchester Ship Canal Company during the six months ending July 31, 1916, of iron, steel, files, screws and cotter pins, oils, tallow, white lead, etc. Specifications, etc., of the Stores Department, Manchester Docks, Trafford-road, Salford.

JANUARY 19.—**Gillingham.**—BUILDERS' MATERIALS.—Supply to the T.C. of the Borough of Gillingham for one year, commencing on April 1, 1916, of builders' materials. Specifications, etc., of Mr. J. L. Redfern, Borough Engineer and Surveyor, Corporation Offices, Gillingham, Kent.

JANUARY 22.—**Norfolk.**—STONE, GRAVEL, ETC.—Supply to the Eastern and Western Highways Committees of the Norfolk C.C. of flints, gravel, chalk, etc., for the year ending March 31, 1917. Specifications, etc., of Mr. W. W. Gladwell, County Surveyor, The Shirehouse, Norwich.

* JANUARY 26.—**Chelsea.**—MATERIALS, ETC.—The Chelsea B.C. invite tenders for supply and execution of certain articles and works.

JANUARY 26.—**Essex.**—STONEWARE PIPES, ETC.—Supply to the Essex C.C., for the year ending March 31, of stoneware pipes, Norwegian granite kerb and setts, York kerbs, etc. Forms of tender, etc., of the County Surveyor, Chelmsford.

JANUARY 26.—**Woolwich.**—BUILDERS' MATERIALS.—Supply to the Council of the Metropolitan Borough of Woolwich of builders' materials from April 1, 1916, to March 31, 1917. Forms of tender, etc., of Mr. J. Sutcliffe, A.M.Inst.C.E., Borough Engineer, Town Hall, Woolwich.

JANUARY 29.—**Wigan.**—BUILDERS' MATERIALS.—Supply to the Corporation for the twelve months commencing April 1 next of builders' materials. Forms of tender, etc., of the Borough Engineer and Surveyor, Mr. A. T. Gooseman, Municipal Offices, King-street West, Wigan.

FEBRUARY 5.—**Earby.**—GRANITE, ETC.—Supply to the U.D.C. during the twelve months ending March 31, 1917, of granite, limestone, tarred limestone, tarred slag, iron castings, etc. Specifications, etc., of Mr. J. E. Aldersley, Surveyor, Council Offices, Earby.

FEBRUARY 5.—**Wallasey.**—BUILDERS' MATERIALS.—Supply to the Corporation during the twelve months ending March 31, 1917, of builders' materials. Forms of tender of Mr. W. H. Travers, A.M.Inst.C.E., Borough Engineer and Surveyor, 18, Falkland-road, Wallasey.

FEBRUARY 7.—**Croydon.**—BUILDERS' MATERIALS.—Supply to the Council of builders' materials for the year ending March 31, 1917. Tender forms of the Borough Engineer, Town Hall, Croydon.

* FEBRUARY 7.—**Hendon.**—WORKS AND MATERIALS.—The Hendon U.D.C. invite tenders for supply of materials and execution of works for one year from April 1 next.

FEBRUARY 7.—**Pembroke.**—BUILDERS' MATERIALS.—Supply to the Pembroke U.D.C., County Dublin, of builders' materials during the twelve months ended March 31, 1917. Specification, etc., can be obtained at the Town Hall, Ballsbridge, Co. Dublin.

MARCH 8.—**Aberaman.**—PAINTS, ETC.—Supply to the directors of the Powell Duffryn Steam Coal Company, Ltd., from April 1, 1916, of paints, etc. Forms of tender, etc., of the Stores Manager, Aberaman Offices, near Aberdare.

ENGINEERING, IRON, AND STEEL.

JANUARY 21.—**Manchester.**—IRON CASTINGS.—Supply of ventilating grids and other castings that may be required in connection with drainwork for the twelve months ending March 31, 1917, for the Corporation. Forms of tender, etc., of Mr. H. Prescott, Manager of the Drainage Department.

JANUARY 31.—**Queensland.**—BRIDGE SUPERSTRUCTURE.—Supply and manufacture of superstructure for bridge over Saltwater Creek, Townsville-Ingham Railway, for the Queensland Government Railways. Plans, etc., at the office of the Agent-General for Queensland, 409-410, Strand, London, W.C.

FEBRUARY 23.—**Johannesburg.**—MACHINERY, ETC.—The supply or supply and erection of machinery and fittings for proposed public wash-house, Newtown, Johannesburg. Documents and drawing may be seen on application to the Council's agents in London, Messrs. E. W. Carling & Co., St. Dunstan's-buildings, St. Dunstan's-hill, E.C. Deposit of £1 1s. is required for copies.

NO DATE.—**Halifax.**—BOILER.—Supply and fixing of a boiler at Salterhebble Council School for the E.C. of the Halifax Corporation. Specifications and forms of tender of Mr. James Lord, M.Inst.C.E., Borough Engineer, Town Hall, Halifax. Deposit, £1.

ROAD, SANITARY, AND WATER WORKS.

JANUARY 15.—**Spilsby.**—GRANITE AND SLAG, ETC.—Supply to the R.D.C. of about 5,000 tons of broken granite, 7,500 tons of broken slag, and 500 tons of slag chippings. Specifications, etc., of Mr. Wm. Cooke Brakenridge, District Surveyor, of Highways, Spilsby.

JANUARY 17.—**Surrey.**—GRANITES, BASALTS, ETC.—Supply to the C.C. of granites, basalts, limestone, slag, tarmacadams, pitch, tar, and tar oils; also flints and fine gravel for footpaths. Specifications, etc., of the County Surveyor, County Hall, Kingston-on-Thames.

JANUARY 17.—**Thurrock.**—SEWER.—For the reinstatement of about 260 ft. of 20-in. diameter cast-iron outfall sewer, including the provision of about 24 tons of 20-in. diameter cast-iron pipes and special castings, for the Thurrock, Grays, and Tilbury Joint Sewerage Board. Drawing and specification prepared by Mr. G. Midgley Taylor Civil Engineer. Form of tender, etc., of the Engineer, Caxton House, Westminster, S.W. Deposit, £2 (cheque only).

JANUARY 18.—**Perry Barr.**—RAG STONE, ETC.—Supply to the U.D.C., during a period of six months and alternatively during a period of twelve months, of (*a*) Rowley rag stone, (*b*) blast furnace cinder or slag. Specifications, etc., of Mr Ernest Bailey, Surveyor to the Council, Council House, Green-lane, Hamstead, Birmingham.

JANUARY 18.—**Reigate.**—SEWERS.—For the construction of sewers at "The Cutting," near St. John's, Redhill, for the T.C. Plans, sections, and specification prepared by Mr. Fred T. Clayton, C.E., the Borough Surveyor. Form of tender, etc., of the Borough Surveyor, Municipal Buildings, Reigate.

JANUARY 19.—**Glamorgan.**—ROAD WIDENING, ETC.—Widening and strengthening the Swansea and Loughor main road between Fforestfach and Kingsbridge for the C.C. Plans and specification can be seen and copies of the bill of quantities obtained at the Police Station, Fforestfach, and of Mr. T. Mansel Franklen, Clerk of the County Council, Glamorgan County Hall, Cardiff.

JANUARY 19.—**Wellington.**—BROKEN GRANITE.—Supply to the U.D.C. of 200 tons of 2½-in. broken granite. Specification, etc., at the Surveyor's Office, 14, Walker-street, Wellington.

JANUARY 20.—**Lambeth.**—BROKEN GRANITE, ETC.—Supply to the B.C., for the period of six months from March 31, 1916, of broken granite, flints, sand, gravel, ballast, etc., Portland cement, lime, etc. Specifications, etc., of Mr. Henry Edwards, C.E., Borough Engineer, Town Hall, Brixton Hill, S.W.

JANUARY 20.—**Mold.**—ROAD MACADAM.—Supply to the Main Roads Committee of the Flintshire C.C. of (*a*) road macadam, chippings, and grit; (*b*) tar macadam; (*c*) broken and unbroken local stone; and (*d*) tar for tar spraying purposes. Forms of tender, etc., of the County Surveyor, County-buildings, Mold, Flintshire.

JANUARY 22.—**Dundee.**—CAST-IRON PIPES.—Supply to the Dundee Water Commissioners of 110 tons or thereby of 4-in. cast-iron pipes. Specification, etc., of the Subscriber, Mr. Wm. H. Blyth Martin, Town Clerk, Dundee.

JANUARY 29.—**Bridgwater.**—STONE.—Supply to the R.D.C. of stone for the roads within the above district for one year from April 1, 1916, to March 31, 1917. Forms of tender, etc., of the Council's Surveyor, Mr. W. H. Cousins, Surveyor's Office, Eastover, Bridgwater, or of Mr. T. M. Reed, Clerk to the Council, Bridgwater.

JANUARY 29.—**Worcester.**—GRANITE, ETC.—Supply to the Worcestershire C.C. of granite, blast furnace slag, and tar macadam during the year ending March 31, 1917. Forms of tender, etc., of Mr. C. F. Gettings, County Surveyor, 30, Foregate-street, Worcester.

Auction Sales.

* JANUARY 25.—**Brockley.**—Messrs. J. T. Skelding & Co. will sell by auction, on the premises, 283, Brockley-road, S.E., the stock, plant, and machinery of tile, mosaic, marble, and builders' merchants.

* JANUARY 26.—Messrs. Churchill & Sim will sell by auction, at the Great Hall, Winchester House, Old Broad-street, E.C., an assortment of deals, battens, boards, timbers, etc.

* FEBRUARY 9.—**Tring (Herts).**—Messrs. J. T. Skelding & Co. will sell by auction, at the Tring Grange, Buckworth, Herts, brickmaking plant, machinery, buildings, and stock of bricks.

[Those with an asterisk (*) are advertised in this issue.]

PRICES CURRENT OF MATERIALS.

[Owing to the exceptional circumstances which prevail at the present time, prices of materials should be confirmed by inquiry.]

Since our last issue wood, metal, and lead prices have been increased.—ED.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the highest or lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

Per 1000 Alongside, in River Thames.	£ s. d.
Best Stocks	2 0 0
Picked Stocks for Facings	2 15 0

Per 1000, Delivered at Railway Depôt, London.	£ s. d.		£ s. d.
Flettons	1 16 0	Best Blue Pressed Staffordshire	3 15 0
Best Fareham Red	3 12 0	Do. Bullnose	4 0 0
Best Red Pressed Ruabon Facing	5 0 0	Best Stourbridge Fire Bricks	4 0 0
GLAZED BRICKS—			
Best White, Ivory, and Salt Glazed Stretchers	13 0 0	D'ble Str'tch'rs	18 10 0
Headers	12 10 0	Double Headers	15 10 0
Quoins, Bullnose and 4½ in. Flats	16 10 0	One Side and two Ends	19 10 0
		Two Sides and one End	20 10 0
		Splays and Squints	18 0 0

Second Quality £1 per 1000 less than best.

	s. d.
Thames and Pit Sand	8 0 per yard, delivered.
Thames Ballast	6 9 „ „

Per ton, delivered.	£ s. d.	£ s. d.
Best Portland Cement	2 5 0 ..	2 8 0
Do. £2 1s. alongside in 80-ton lots.		
Ferrocrete 2s. 6d. per ton extra on above.		
Best Ground Blue Lias Lime	1 1 0 ..	—

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime ..... 17s. 0d. per yard delivered.
Stourbridge Fireclay in s'cks 35s. 0d. per ton at rly. dpt.

STONE.

	s. d.
BATH STONE—delivered in railway trucks at Westbourne Park, Paddington, G.W.R., or South Lambeth, G.W.R., per ft. cube	1 7
Do. do. delivered in Railway trucks at Nine Elms, L. & S.W.R., per ft. cube	1 8½
Do. do. delivered on road waggons, Nine Elms Depôt	1 9½
PORTLAND STONE— Brown Whitbed, in random blocks of 20 ft. average, delivered in railway trucks at Westbourne Park, G.W.R., South Lambeth, G.W.R., or Nine Elms, L. & S.W.R., per ft. cube	2 5½
Do. do. delivered on road waggons at Pimlico Wharf or Nine Elms Depôt, per ft. cube	2 6½
White Basebed, 2d. per ft. cube extra.	

Per Ft. Cube, delivered at Railway Depôt.	s. d.		s. d.
Ancaster in blocks	1 11	Red Corsehill in blocks	2 6
Beer in blocks	1 7	Closeburn Red Freestone	2 2
Greenshill in blocks	2 0	Red Mansfield Freestone	2 6
Darley Dale in blocks	2 6		

YORK STONE—*Robin Hood Quality.*

Per Ft. Cube, Delivered at Railway Depôt.	s. d.
Scappled random blocks	2 10
Per Ft. Super., Delivered at Railway Depôt.	
6 in. sawn two sides landings to sizes (under 40 ft. super.)	2 8
6 in. rubbed two sides ditto, ditto	3 2
3 in. sawn two sides slabs (random sizes)	1 0
2 in. to 2½ in. sawn one side slabs (random sizes)	0 8
1½ in. to 2 in. ditto, ditto	0 6½

HARD YORK—

Per Ft. Cube. Delivered at Railway Depôt.	
Scappled random blocks	3 0
Per Ft. Super., Delivered at Railway Depôt.	
6 in. sawn two sides landing to sizes (under 40 ft. super.)	2 9
6 in. rubbed two sides ditto	3 3
3 in. sawn two sides slabs (random sizes)	1 2½
2 in. self-faced random flags	0 6

TILES.

Per 1000 f.o.r. London.	£ s. d.
Best machine-made tiles or hand-made sand-faced tiles from either Broseley or Staffordshire district	2 12 6
Ornamental ditto	2 15 0
Hip and valley tiles (per dozen)	0 5 6

SLATES.

Per 1000 of 1200 f.o.r. London.	£ s. d.
Best Blue Bangor slates, 20 by 10	11 16 0
First quality „ „	11 10 0
„ „ 16 by 8	5 15 0
Best Blue Portmadoc, 20 by 10	11 13 6
First quality „ „	11 3 6
„ „ 16 by 8	5 15 0

WOOD.

BEST BUILDING REDWOOD.

Imported sizes.	Per standard. £ s. d.		£ s. d.
Deals: 4 in. by 12 in., 4 in. by 11 in., 3 in. by 11 in., 4 in. by 9 in., and 2 in. by 11 in.	25 0 0 ..		26 0 0
3 in. by 9 in., 2½ in. by 9 in. and 2 in. by 9 in.	24 0 0 ..		25 0 0

WOOD (*Continued*).

BEST BUILDING REDWOOD.

	Per standard. £ s. d.		£ s. d.
Battens: 2 in., 2½ in., and 3 in. by 8 in.			
2 in., 2½ in., and 3 in. by 7 in.			
2 in., 2½ in., and 3 in. by 6 in.			
2 in., 2½ in., and 3 in. by 5 in.	22 10 0 ..		23 10 0
Scantlings: 2 in. by 3 in., 2 in. by 3½ in., 2 in. by 4 in., 2 in. by 4½ in.			
3 in. by 4 in., and 3 in. by 4½ in.			
Boards: 1 in., 1¼ in., and 1½ in. by 6 in. and 7 in.	0 10 0	} more than battens.	
¾ in.	1 0 0		
Seconds: building quality deals, battens, boards, and scantlings	1 0 0	less than best.	
Best Middling Dantzic and Memel Fir Timber Logs (average specification)	Per load of 50 ft. cube. 8 10 0 ..		—
Seconds do. do.	8 0 0 ..		—
9 in. to 10 in. do.	7 0 0 ..		—
6 in. to 8 in. do.	6 10 0 ..		—
Stocks very limited.			
Sawn pitch pine logs (about 35 cu. ft. average)	Per load. 9 0 0 ..		9 10 0
Do. 6 in. to 10 in.	7 0 0 ..		7 5 0
Sawn Swedish Balks 4 in. by 4 in. to 6 in. by 7 in.	6 10 0 ..		7 0 0
	Per standard.		
Best Pitch Pine Deals	34 0 0 ..		35 0 0
Rio do.	23 0 0 ..		25 0 0
Under 2 in. thick	0 10 0		extra.

JOINERS' WOOD.

White Sea First Quality Red: 4 in. by 11 in.	35 0 0 ..		36 0 0
3 in. by 11 in., and 2 in. by 11 in.	34 0 0 ..		35 0 0
4 in. by 9 in.	33 0 0 ..		34 0 0
3 in. by 9 in., and 2½ in. by 9 in.	32 0 0 ..		33 0 0
9 in. by 11 in. boards	1 0 0		more than deals.
7 in. and 8 in. battens	24 0 0 ..		25 0 0
7 in. and 8 in. boards	1 0 0		more than battens.
Seconds quality	2 0 0		less than best.
Third quality	£2 to £3		less than seconds.
Archangel White Deals— Best 3 in. by 11 in.	28 0 0 ..		29 0 0
3 in. by 9 in. and 10 in.	26 0 0 ..		27 0 0
Seconds, do.	1 10 0		less than best.
U.S. Battens	19 10 0 ..		20 0 0
Prepared Floorings and Matchings, Seconds Swedish Red and equal—	Per square actual.		
1¼ in. by 7 in. planed and shot	1 5 6 ..		1 10 0
1¼ in. by 7 in. planed and matched	1 6 0 ..		1 10 0
1 in. by 7 in. planed and shot	1 0 0 ..		1 3 0
1 in. by 7 in. planed and matched	1 1 0 ..		1 4 6
¾ in. by 7 in. planed, matched and beaded, or V jointed	0 16 0 ..		0 17 6
1 in. by 7 in. do.	1 1 0 ..		1 3 6
¾ in. by 7 in. do.	0 13 0 ..		0 14 0
6 in. at 6d. per square less than 7 in.			
5 in. and 5½ in. at 6d. per square less than 6 in.			
Columbian or Oregon Pine, best quality	Per standard. 35 0 0 ..		40 0 0
Yellow Pine—First, regular sizes	57 0 0		upwards.
Oddments	39 0 0		„
Seconds, regular sizes	43 10 0		„
Oddments	37 10 0		„
Kauri Pine—Planks per ft. cube	0 7 6 ..		—
Oak Logs— Large, per ft. cube	0 6 0 ..		0 6 6
Small „ „	0 5 0 ..		0 5 6
Wainscot Oak Logs, per ft. cube	0 10 6 ..		0 12 6
Dry Wainscot Oak, per ft. super, as inch	0 1 0 ..		0 1 3
¼ in. do. do.	0 0 10 ..		0 1 0
Dry Mahogany—Honduras, Tabasco, per ft. super, as inch	0 1 0 ..		0 1 4
Selected, Figury, per ft. super, as inch	0 1 6 ..		0 2 6
Cuba Mahogany	0 1 6 ..		0 2 6
Dry Walnut, American, per super, as inch	0 1 0 ..		upwards. 0 1 3
French, "Italian," Walnut	0 1 0 ..		0 1 6
Teak, per load (Rangoon or Moulmein)	28 0 0 ..		34 0 0
Do. do. (Java)	25 0 0 ..		27 0 0
American Whitewood planks, per ft. cube	0 6 6 ..		0 7 6

METALS.

JOISTS, GIRDERS, &c.

	In London or delivered Railway Vans, per ton. £ s. d.		£ s. d.
Rolled Steel Joists, ordinary sections, basis price	20 5 0 ..		21 5 0
Plain Compound Girders, ordinary Sections	22 0 0 ..		23 0 0
Plain Compound Stanchions	23 0 0 ..		24 10 0
Angles, Tees, and Channels, ordinary sections	20 10 0 ..		21 10 0
Flitch Plates	20 10 0 ..		21 10 0
Cast Iron Columns and Stanchions, plain ordinary patterns	13 10 0 ..		14 0 0

(Turning extra.)

METALS (*Continued*).

	Per ton, in London. £ s. d.		£ s. d.
IRON— Common Bars	16 0 0 ..		—
Staffordshire Crown Bars, good merchant quality	16 10 0 ..		17 0 0
Staffordshire "Marked Bars"	17 0 0 ..		17 10 0
Mild Steel Bars	16 10 0 ..		17 0 0
Steel Bars, Ferro-Concrete quality, £17 10s. basis price.			
Hoop Iron, basis price	17 10 0 ..		—
„ „ Galvanised	30 0 0 ..		35 0 0
(*And upwards, according to size and gauge.)			
Sheet Iron Black— Ordinary sizes to 20 g.	18 0 0 ..		—
„ „ 24 g.	19 0 0 ..		—
„ „ 26 g.	20 0 0 ..		—
Sheet Iron, Galvanised flat, ordinary quality— Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 20 g.	29 0 0 ..		—
Ordinary sizes to 22 g. and 24 g.	29 10 0 ..		—
Ordinary sizes to 26 g.	32 0 0 ..		—
Sheet Iron, Galvanised, flat, best quality— Ordinary sizes to 20 g.	30 0 0 ..		—
„ „ 22 g. and 24 g.	30 10 0 ..		—
Ordinary sizes to 26 g.	33 10 0 ..		—
Galvanised Corrugated Sheets— Ordinary sizes, 6 ft. to 8 ft. 20 g.	28 0 0 ..		—
Ordinary sizes, 22 g. & 24 g.	28 10 0 ..		—
Ordinary sizes, 26 g.	29 0 0 ..		—
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. to 20 g. and thicker	19 15 0 ..		—
Best Soft Steel Sheets, 22 g. & 24 g.	20 0 0 ..		—
Best Soft Steel Sheets, 26 g.	21 15 0 ..		—
Cut Nails, 3 in. to 6 in.	18 10 0 ..		19 0 0
(Under 3 in., usual trade extras.)			

LEAD, &c.

Delivered in London.	£ s. d.		£ s. d.
LEAD—Sheet, English, 4 lb. and up	38 10 0 ..		—
Pipe in coils	39 0 0 ..		—
Soil pipe	42 0 0 ..		—
Compo pipe	42 0 0 ..		—
NOTE—Country delivery 20s. per ton extra; lots under 5 cwt. 1s. per cwt. extra.			
COPPER— Strong Sheet per lb.	0 1 5 ..		—
Thin „	0 1 6 ..		—
Copper nails „	0 1 5 ..		—
Copper wire „	0 1 5 ..		—
BRASS— Strong Sheet „	0 1 3 ..		—
Thin „	0 1 4 ..		—
TIN—English Ingots „	0 1 10 ..		—
SOLDER—Plumbers' „	0 0 10 ..		—
Tinmen's „	0 1 0 ..		—
Blowpipe „	0 1 2 ..		—

GLASS.

ENGLISH SHEET GLASS IN CRATES OF STOCK SIZES AND IN SQUARES IN ORDINARY SIZES.

Per Ft.		Per Ft.	
15 oz. thirds	5½d.	32 oz. thirds	8½d.
21 oz. thirds	6½d.	„ fourths	7½d.
„ fourths	6½d.	Fluted Sheet, 15 oz.	5½d.
26 oz. thirds	7d.	„ 21 oz.	6½d.
„ fourths	6½d.		

ENGLISH ROLLED PLATE IN CRATES OF STOCK SIZES.

	Per Ft.
⅛ Rolled plate	4d.
⅜ Rough rolled and rough cast plate	4½d.
½ Rough rolled and rough cast plate	4½d.
Figured Rolled, Oxford Rolled, Oceanic, Arctic, Muffled, and Rolled Cathedral, white	5d.
Ditto, tinted	6½d.
Rolled Sheet	4d.

OILS, &c.

		£ s. d.
Raw Linseed Oil in pipes per gallon		0 3 9
„ „ „ in barrels	„	0 3 10
„ „ „ in drums	„	0 4 1
Boiled „ „ in barrels	„	0 4 0
„ „ „ in drums	„	0 4 4
Turpentine in barrels	„	0 4 6
„ in drums	„	0 4 9
Genuine Ground English White Lead, per ton (In not less than 5 cwt. casks.)		45 15 0
Red Lead, Dry per ton		42 10 0
Best Linseed Oil Putty per cwt.		0 10 0
Stockholm Tar per barrel		1 12 0
GENUINE WHITE LEAD PAINT— "Blackfriars," "Nine Elms," "Park," and other best brands (in 14 lb. tins) not less than 5 cwt. lots per ton delivered		56 15 0

VARNISHES, &c.

Per gallon.	£ s. d.
Fine Pale Oak Varnish	0 8 0
Pale Copal Oak	0 10 6
Superfine Pale Elastic Oak	0 12 6
Fine Extra Hard Church Oak	0 10 0
Superfine Hard-drying Oak, for seats of Churches	0 14 6
Fine Elastic Carriage	0 12 9
Superfine Pale Elastic Carriage	0 16 0
Fine Pale Maple	0 10 0
Finest Pale Durable Copal	0 18 6
Extra Pale French Oil	1 1 0
Eggshell Flating Varnish	0 18 0
White Pale Enamel	1 4 0
Extra Pale Paper	0 12 0
Best Japan Gold Size	0 10 0
Best Black Japan	0 16 0
Oak and Mahogany Stain	0 9 0
Brunswick Black	0 8 0
Berlin Black	0 16 0
Knotting	0 10 0
French and Brush Polish	0 10 0

TO CORRESPONDENTS.

NOTE.—All communications with respect to literary and artistic matters should be addressed to "THE EDITOR" (and not to any person by name); those relating to advertisements and other exclusively business matters should be addressed to THE BUILDER LTD., and *not* to the Editor.

All communications must be authenticated by the name and address of the sender, whether for publication or not. No notice can be taken of anonymous communications.

The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors.

We cannot undertake to return rejected communications; and the Editor cannot be responsible for drawings, photographs, manuscripts, or other documents, or for models or samples sent to or left at this office, unless he has specially asked for them.

All drawings sent to or left at this office for consideration should bear the owner's name and address on either the face or back of the drawing. Delay and inconvenience may result from inattention to this.

Any commission to a contributor to write an article, or to execute or lend a drawing for publication, is given subject to the approval of the article or drawing, when received, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

N.B.—Illustrations of the First Premiated Design in any important architectural competition will always be accepted for publication by the Editor, whether they have been formally asked for or not.

PATENTS.

APPLICATIONS PUBLISHED.*

13,118 of 1914.—Henry Quilter: Construction of shuttering for moulding concrete or similar composite material, whether reinforced with metal or not.

15,346 of 1914.—John Parsons, jun., and Benjamin Claude Andrew: Scaffolding and the like.

23,651 of 1914.—Chester Arthur Finch: Adjustable drawing curves.

23,673 of 1914.—Hilliard Neil Alexander McLean: Cleaning of water-closet seats.

24,425 of 1914.—Nicola Maria Marinaro: Step ladders.

909 of 1915.—William Frederick Baldwin: Machines for sweeping roads and other surfaces.

2,617 of 1915.—Robert Grabowsky: Furnace walls.

4,585 of 1915.—John Horace Bowden and Henry Francis Jackson Thompson: Protection of electric cables.

5,105 of 1915.—Carl John Frederik Ohlsson: Self-contained shops, kiosks, and the like.

10,007 of 1915.—Joseph Southall: Machines for mixing concrete and other materials.

10,051 of 1915.—Waygood-Otis, Ltd., and Robert Falkland Carey: Safety appliances for lifts.

11,364 of 1915.—Richard Whalley: False-grate or fuel-economiser for domestic fireplaces.

11,495 of 1915.—Reginald Haddan (Barry Company): Shaft hangers or stands and journal-boxes therefor.

11,520 of 1915.—William Philpot Curran Bain: Wire fencing.

13,810 of 1915.—Andrew Edward Ruth: Ratchet wrench for engaging nipples and the like.

15,753 of 1915.—Carl Lorens Carlson and Grunnar Bergstrom: Apparatus for ascertaining the direction of bore-holes.

* All these applications are in the stage in which opposition to the grant of Patents upon them can be made.

TENDERS.

Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than 2 p.m. on Wednesday.* [N.B.—We cannot publish Tenders unless the amount of the Tender is stated.]

* Denotes *accepted.* † Denotes *provisionally accepted.*

AUCKLAND.—Accepted for the erection of a new engine-house at the waterworks, for the Urban District Council:—

Joiner's Work: T. Manners	£189	15	0
Electric Lighting: D. Latham & Co.	36	0	0
Plastering: S. Kirby	30	0	0
Slating: J. Maskall	51	0	0
Painting and Glazing: J. Cottrell	16	12	6

BIRMINGHAM.—Accepted for the erection of temporary generating-station at Nechells, for the Electric Supply Committee:—

Three Boilers, with Superheaters, Chain-grate Stokers, Chimneys, etc.
Babcock & Wilcox, Ltd., London .. £17,000

Structural Steelwork.
E. C. & J. Keay, Ltd. £5,800

Cooling Towers (including Foundations).
Davenport Engineering Co., Bradford £5,550

Foundations (Engine and Boiler House).
J. J. Shardlow £3,500

Coal-handling Plant (Overhead Telpherage System).
H. Morris, Ltd., Loughborough £3,500

HARTFORD END (Essex).—For repairs to Hartford End Bridge, for the Essex County Council:—
H. Potter, Chelmsford* £132

LICHFIELD.—For laying a 9-in. sewer in Roman-road, Streetly, to Mr. Greatrex's houses, for the Rural District Council. Messrs. Jeffries & Shipley, architects, Walsall:—
Childs & Withers, Worcester‡ £310 6
‡ Recommended for acceptance.

LONDON.—Accepted by the Metropolitan Water Board for the supply of the undermentioned materials:—
Battersea (renewal of stock)—Painted steam tube of varying dimensions, Scottish Tube Company, Ltd., £79 11s. 10d. (less 2½ per cent.).
Battersea (renewal of stock)—Black tarpaulins, J. Smith & Co., £26 8s.
Battersea (renewal of stock)—Third bright Swedish yellow deals, W. W. Howard Bros. & Co., £101 16s. 8d. (approximate).
Littleton Reservoirs—Mild steel bolts, nuts, and washers, and mild steel plugs and washers, F. W. Cotterell, Ltd., £120.
Hampton—Tubes for fuel economiser, Scottish Tube Company, Ltd., £507 10s.
Hampton—Lead, Geo. Farmiloe & Sons, Ltd., £46 4s. 7d.
Battersea—Lead pipe, J. R. Miles & Son, £55 (approximate).
Hampton-on-Thames—Sheet brass, J. R. Miles & Son, £29 (approximate).
Hampton-on-Thames—Copper cable for coal unloading plant, F. Smith & Co., £175 (approximate).
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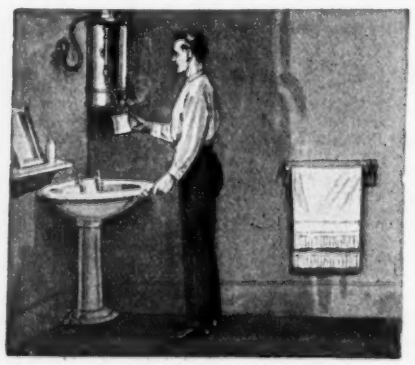
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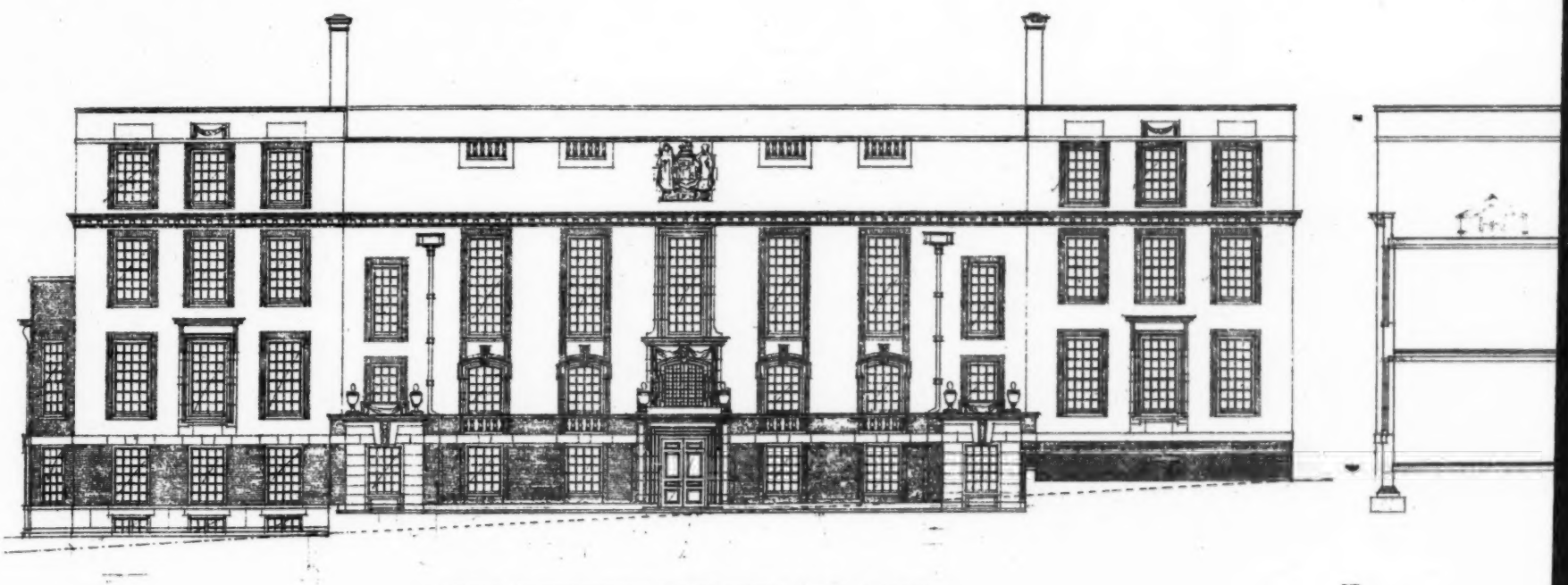

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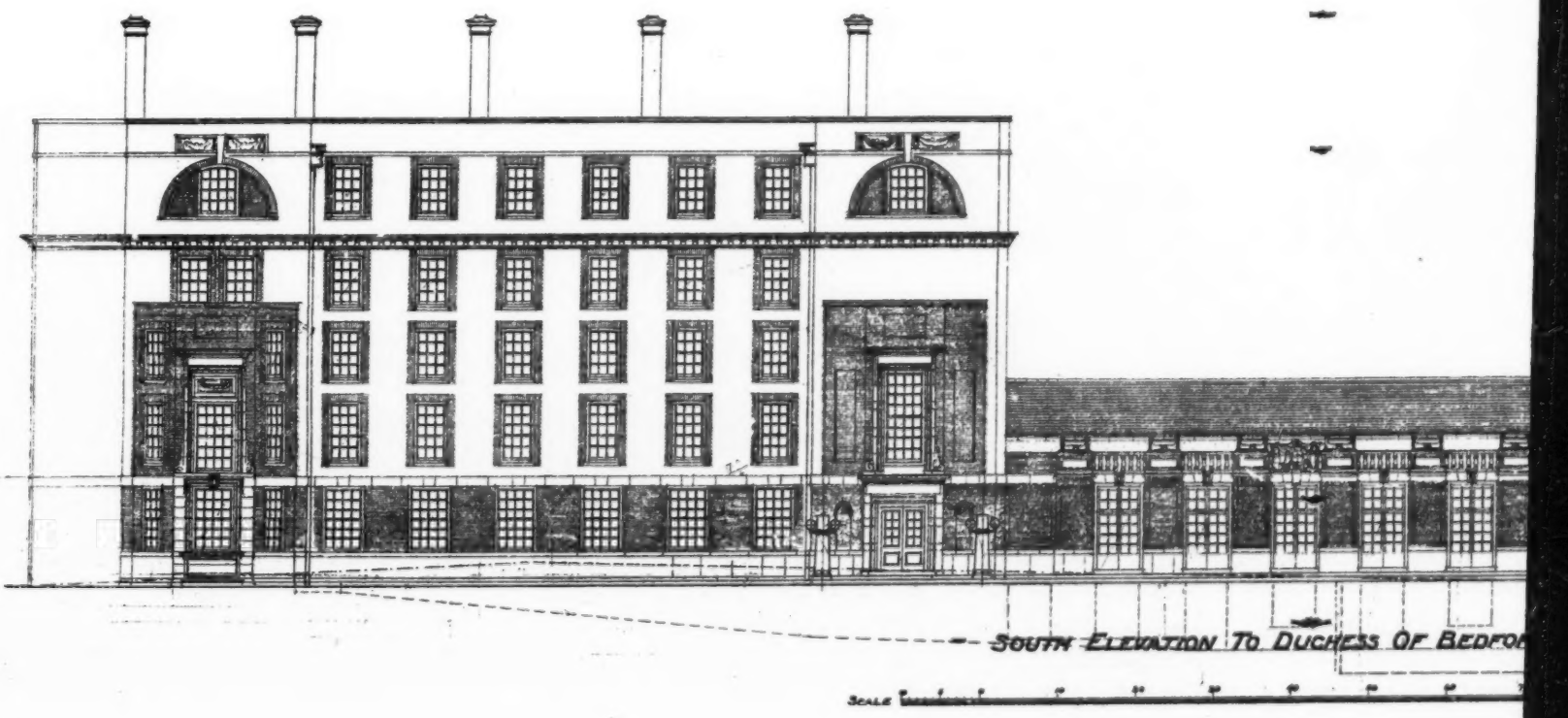

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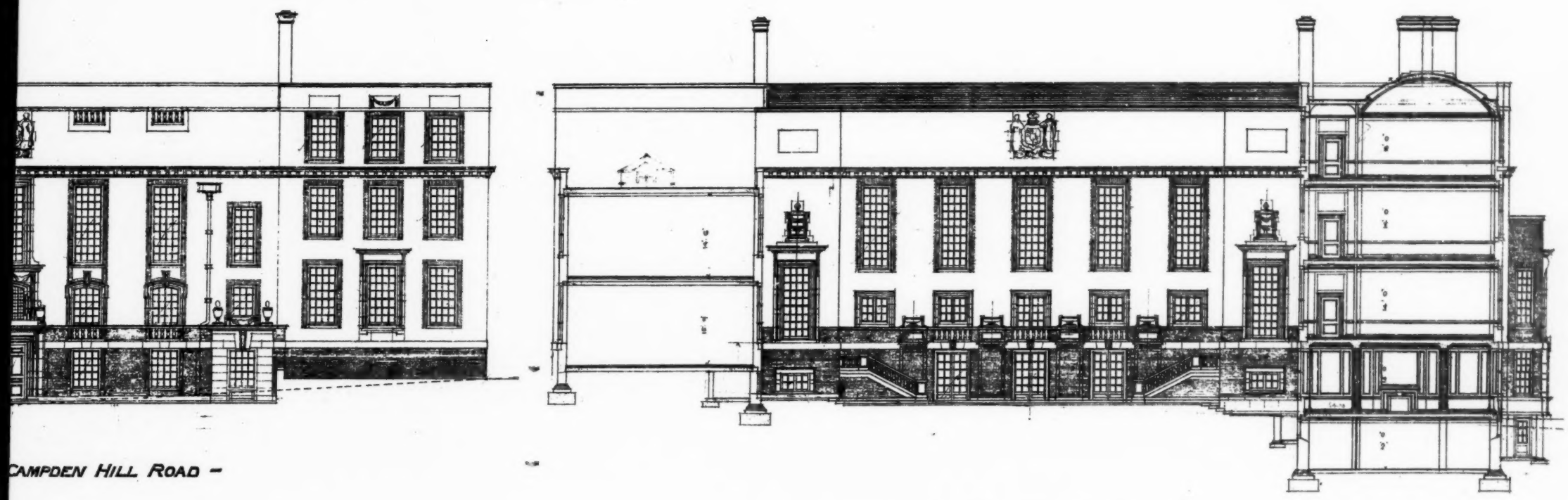

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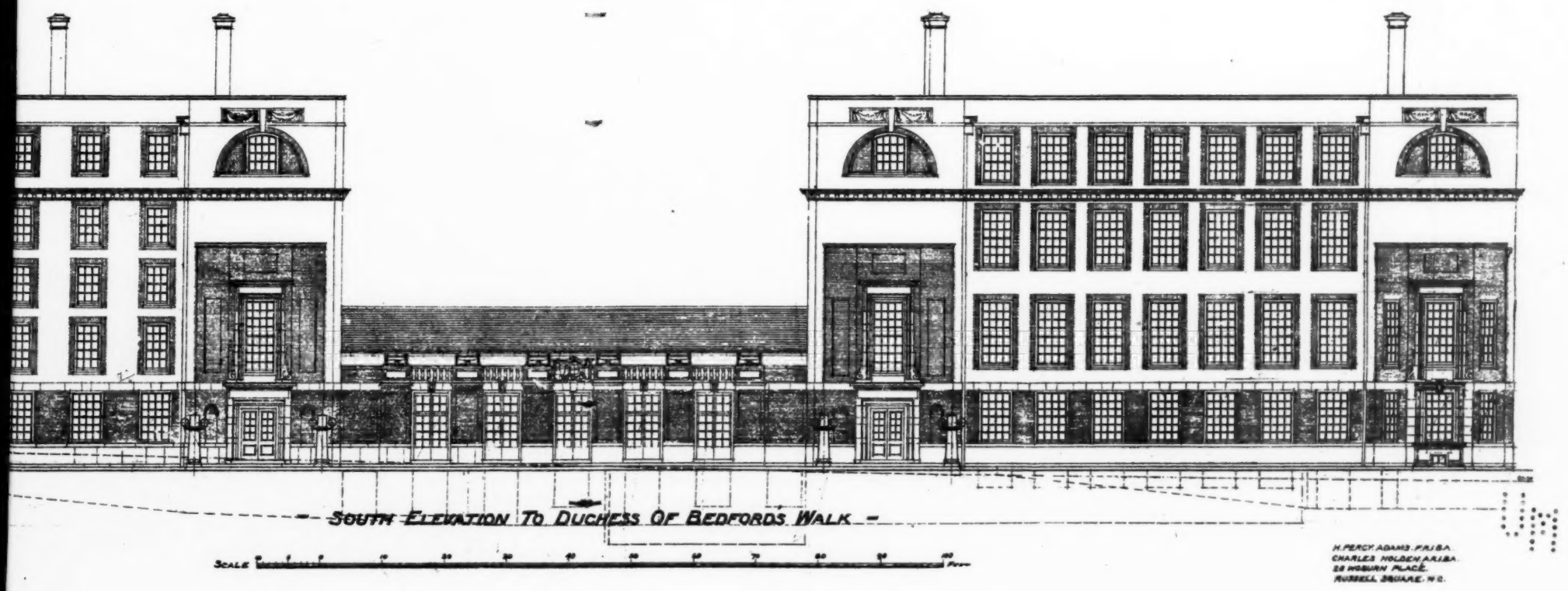

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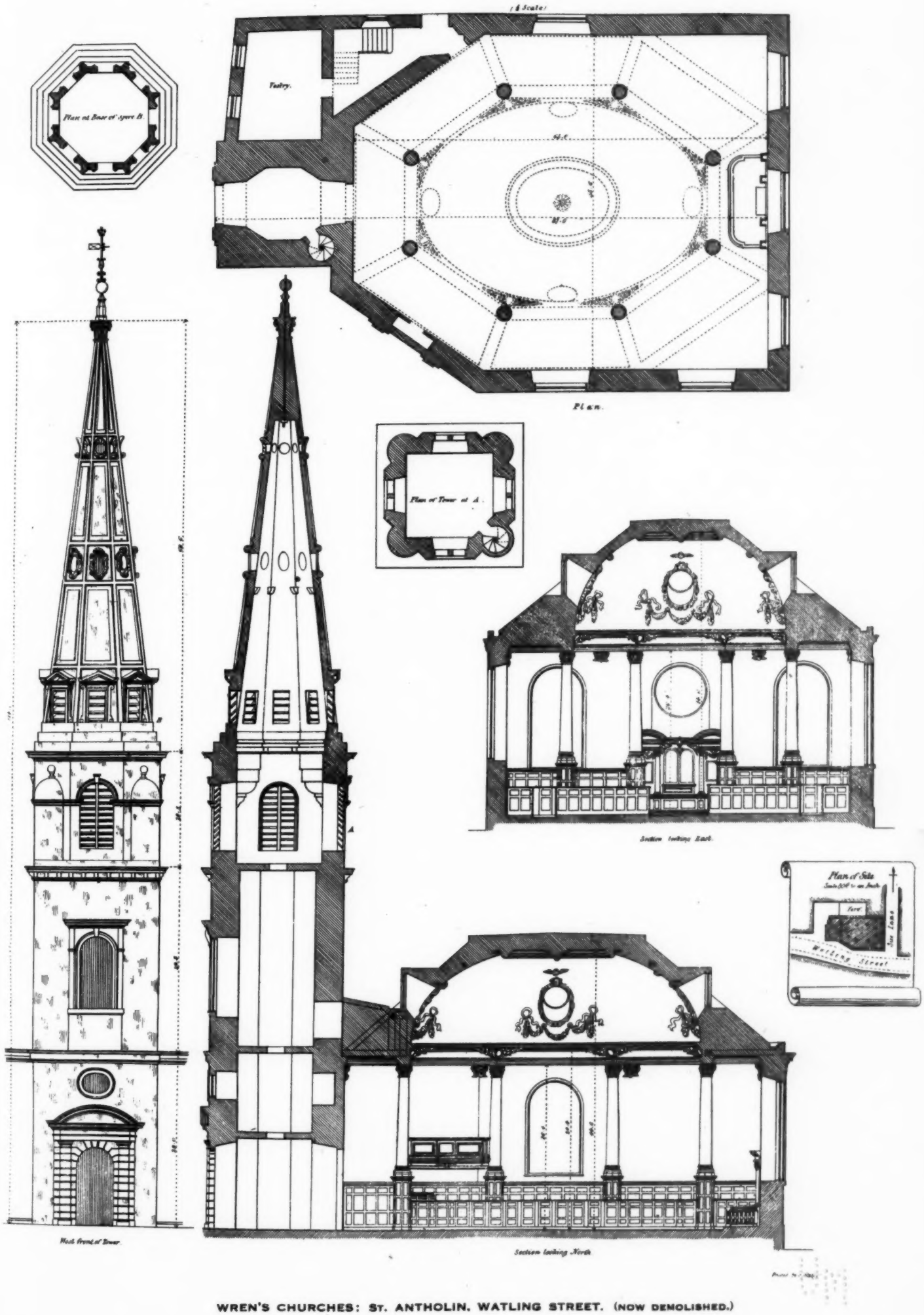

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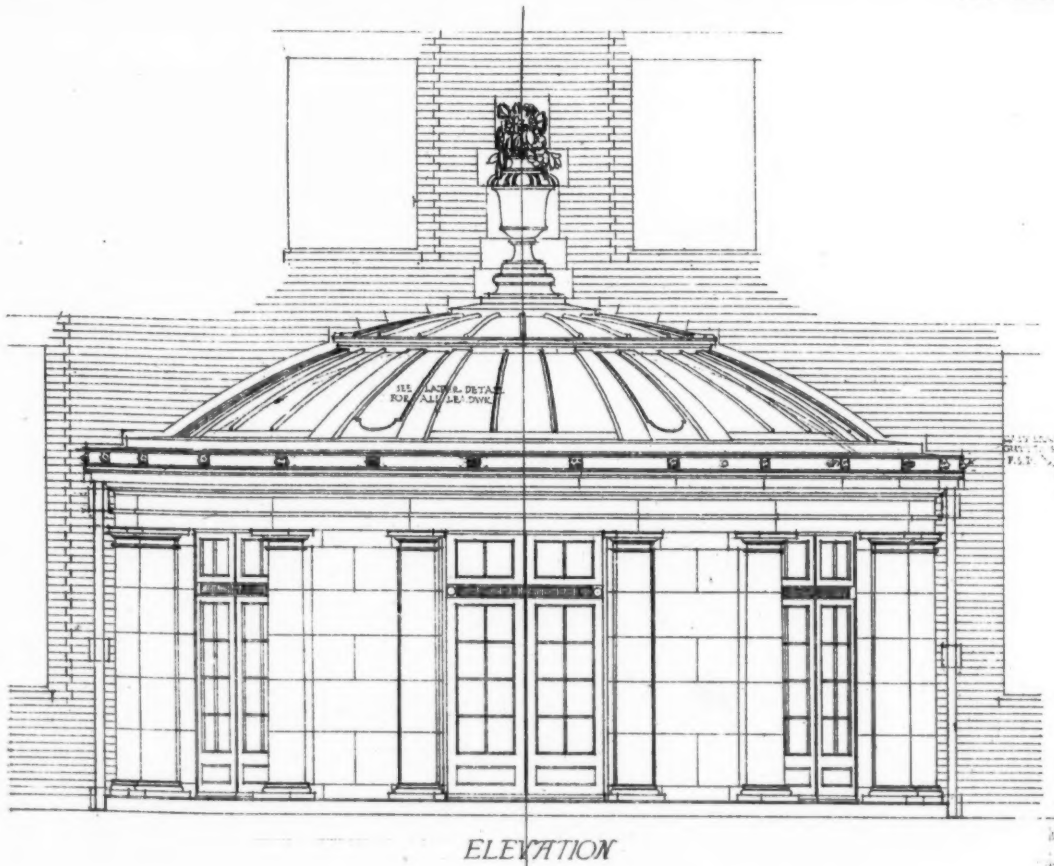

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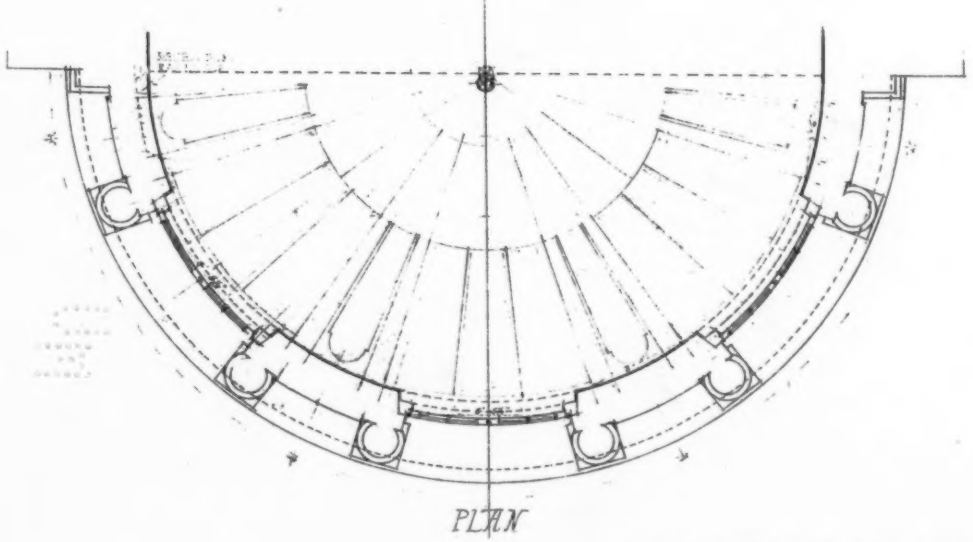

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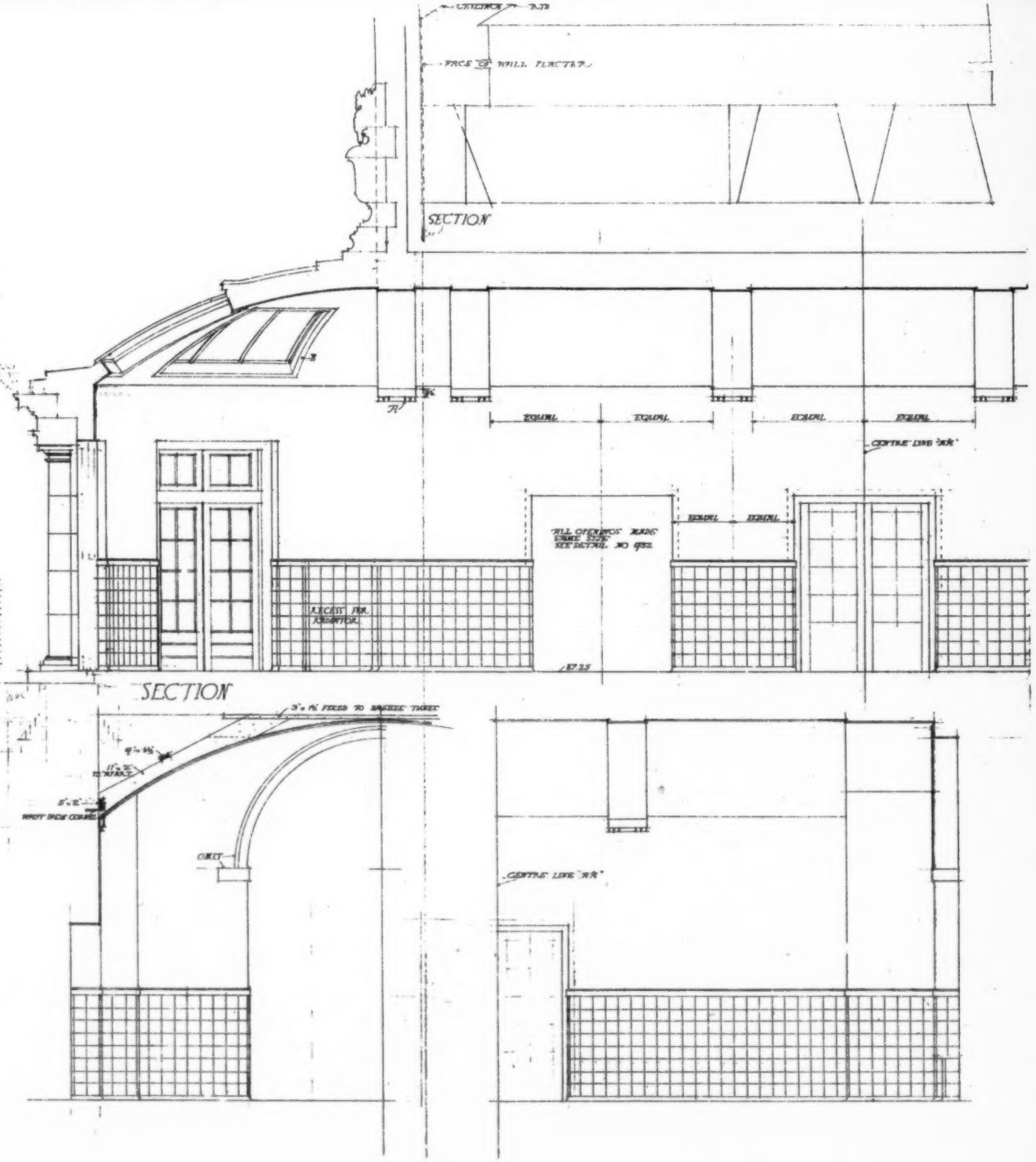

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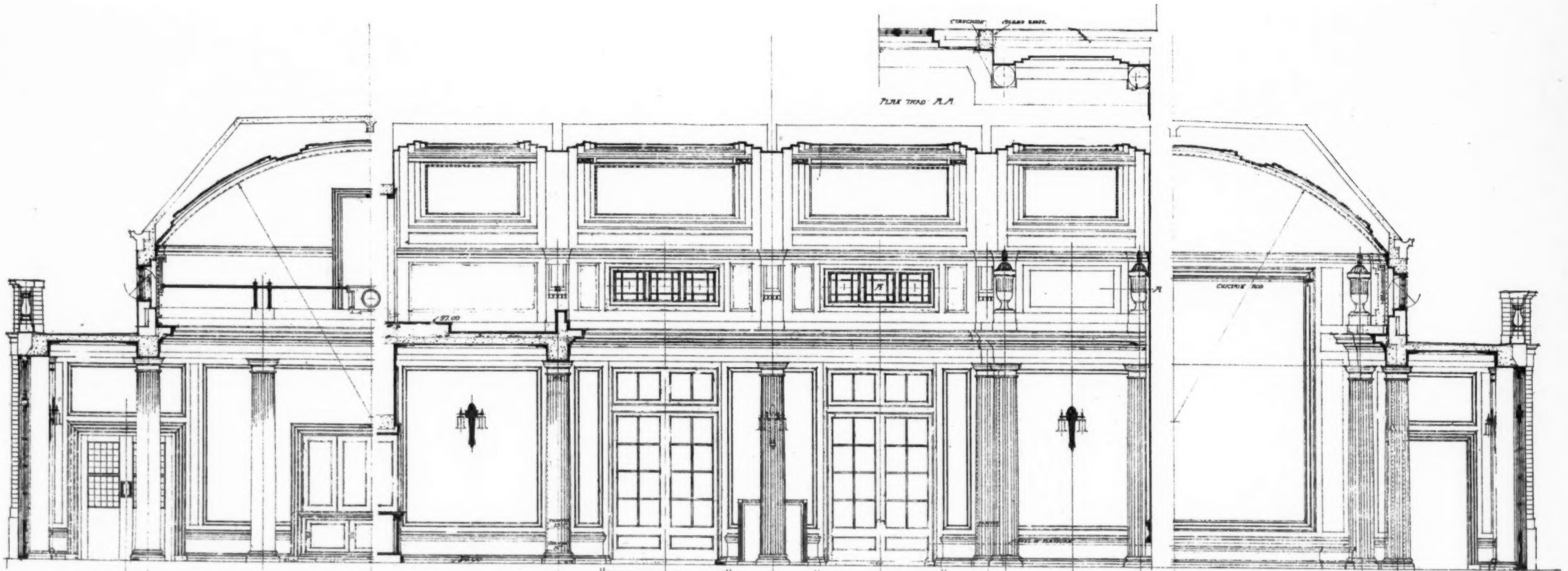

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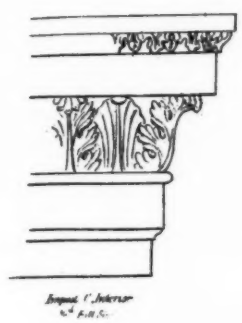

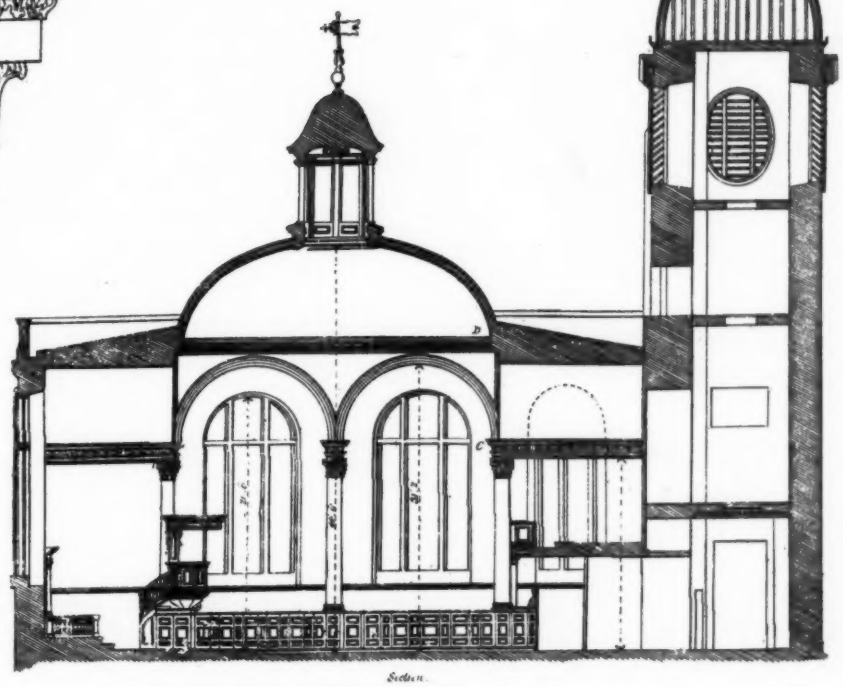

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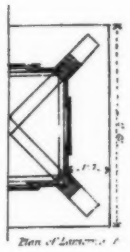

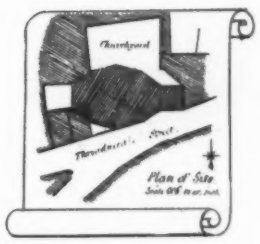

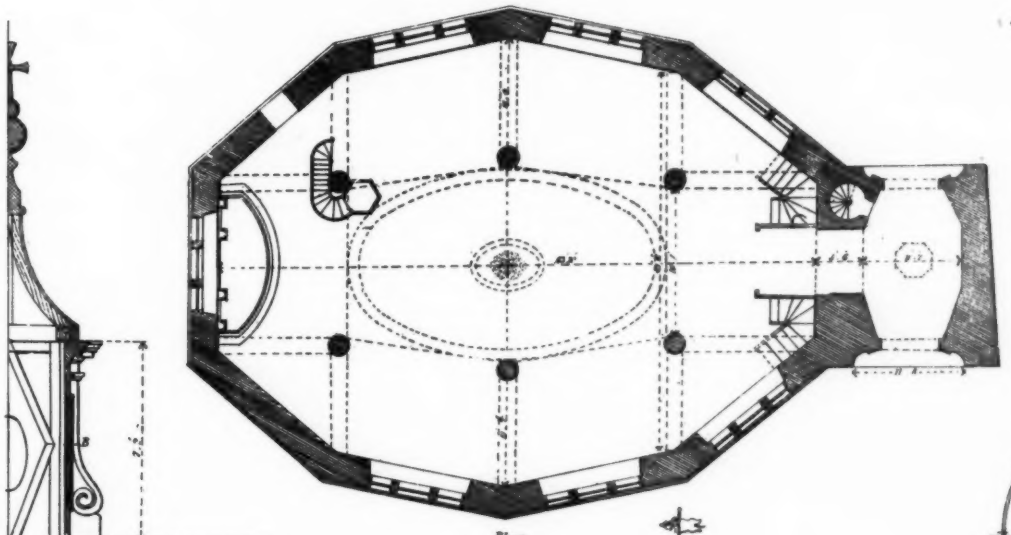

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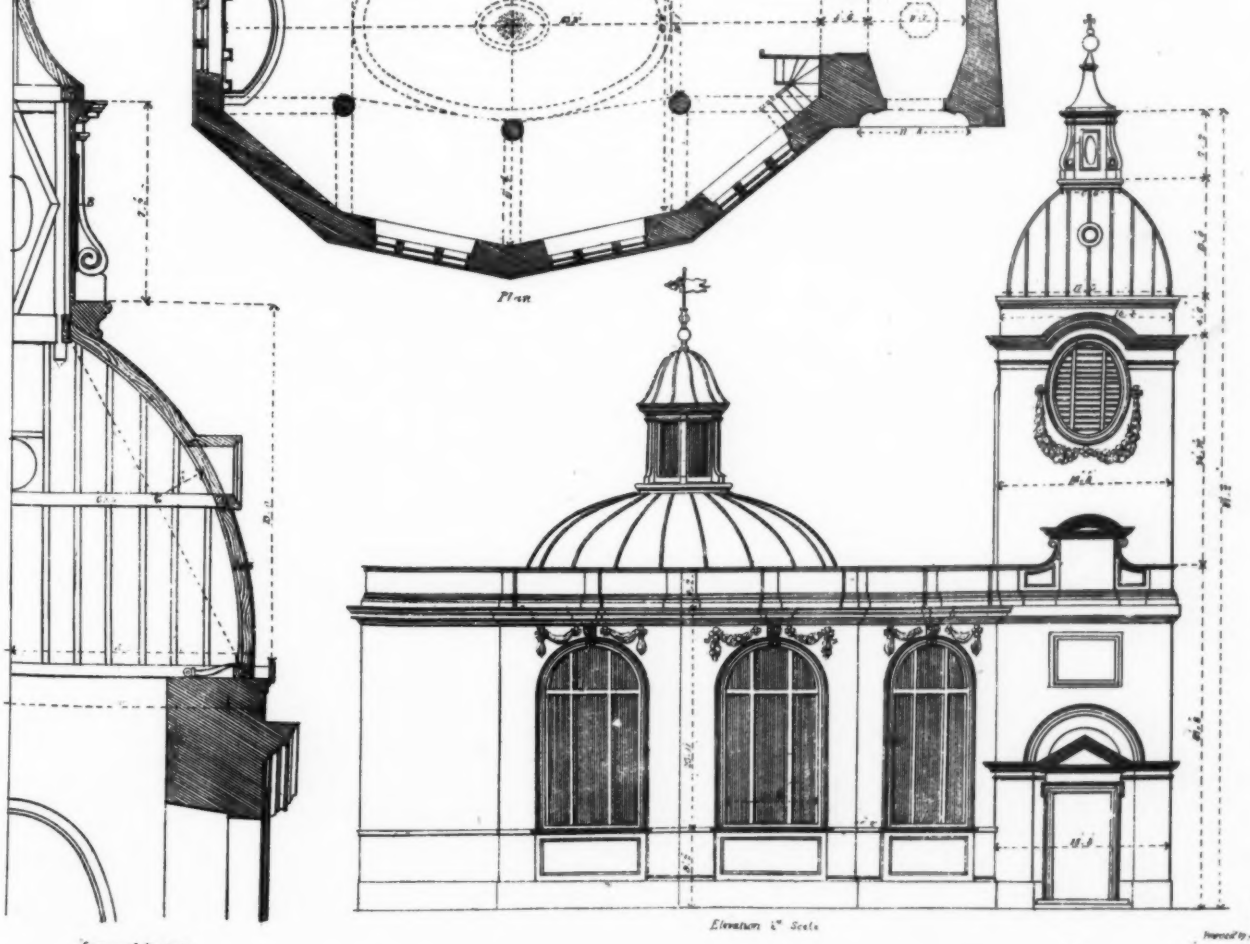

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